

**ARMY PROGRAMS**

**VALUE ENGINEERING**

**PROGRAM MANAGEMENT**

**GUIDELINES**

DEPARTMENT OF THE ARMY  
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VALUE ENGINEERING PROGRAM MANAGEMENT GUIDELINES

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## FOREWORD

The management guidelines contained in this pamphlet are intended to provide program managers with guidance information on planning and control of the VE programs. In some instances, non-VE actions are described so the VE Program Manager will have an insight into how these actions are integrated into the total VE program.

Chapter 1 provides a general introduction to the VE program. Chapter 2 details the general management actions necessary to establish and operate a program. Chapter 3 describes the support activities that are necessary to support the DARCOM Value Engineering Program. Chapter 4 describes Value Engineering management during the materiel life cycle. Chapter 5 describes the planning and review of VE program events when the management of development, production and deployment of systems/items is to be accomplished completely by either the Government or by the contractor. Chapter 6 covers the management of Value Engineering proposals from project selection through proposal implementation. Chapter 7 covers Value Engineering management during the acquisition and operation/maintenance phases of Army materiel.

Although careful planning and control actions are a necessary ingredient to a comprehensive VE program, the approaches suggested in this pamphlet are no substitute for imaginative and dynamic actions on the part of each individual having responsibility for this important effort.

## CHAPTER I

### INTRODUCTION

1-1. Purpose. This pamphlet provides guidance to US Army Materiel Development and Readiness Command Value Engineering Program Managers (VEPMs) for the development of a total and effectively integrated Value Engineering (VE) Program within DARCOM. This pamphlet identifies planning necessary to develop a VE program and further identifies key actions which must be taken throughout the operation of the program in order to give it continued emphasis and direction.

1-2. Scope. This pamphlet is applicable to VEPMs at Headquarters DARCOM, major subordinate commands (including subordinate installations, activities and depots), project managers and all installations and activities reporting directly to Headquarters DARCOM, that have development, engineering, test and evaluation, production, acquisition and/or supply and maintenance responsibility.

1-3. General. **DARCOM-R 70-8**, "DARCOM Value Engineering Program," prescribes objectives, policies, responsibilities and reporting requirements for assuring maximum implementation and effectiveness of the Department of the Army Value Engineering Program within DARCOM. This pamphlet supplements DARCOM-R 70-8 by providing guidance for planning and operating the program and sets forth the actions that should be considered for the development of a successful program. It is not the intent of this publication to define specific activities and responsibilities for each level of command and every program manager. However, this pamphlet does outline the significant management and control elements considered necessary for a total and successful VE program.

## CHAPTER 2

## VALUE ENGINEERING PROGRAM

2-1. Establishment and operation of the program. The development of a total VE program requires certain management actions to develop, establish, and operate the program. It is the purpose and intent of this section to delineate and discuss these separate development actions.

2-2. Organization. DARCOM-R 70-8 grants to the commanders of the major subordinate commands, project managers reporting to DARCOM, and the commanders of those separate installations and activities reporting directly to Headquarters DARCOM, having development, engineering, test and evaluation, production, acquisition, and/or supply and maintenance responsibilities, the authority and responsibility to establish a VE organization. The purpose of this organization is to implement the policies stated in DARCOM-R 70-8 and to promote the accomplishment of the objectives of the DARCOM VE program.

2-3. Assign program manager. a. Commanders of those organizations listed within the scope of this pamphlet must appoint a qualified individual to act in the capacity of a VE Program Manager (VEPM). Organizationally, the VEPM should be placed sufficiently high in the management structure to be independent of specialized functional interests. The VEPM should report directly to the commander or deputy commander with authority equal to that of any other staff management.

b. The qualifications that the VEPMs must possess are:

- (1) Must be knowledgeable in VE philosophy and practices.
- (2) Must possess a thorough knowledge of the organization and working relationships throughout DARCOM and within their commands.
- (3) Must possess the managerial skills and attributes required to develop, promote, and maintain the VE program.
- (4) Must possess a keen understanding of social dynamics and intrapersonal relations so as to effectively overcome roadblocks that restrict the VE program.

2-4. Publish policy directive. One of the first tasks of the VEPM is to publish a regulation in support of DARCOM-R 70-8. This regulation should contain within its policy section at least the following items:

- a. A statement of management support for the VE program.
- b. A delineation of the responsibility and authority of the VEPM within the framework of the guidance of DARCOM-R 70-8.

c. A written statement encouraging cooperation between the VEPM and other members of management.

d. An outline of the working relationship between the VEPM and other members of management.

2-5. Establish goals and objectives. a. The VEPM s must, within the framework of DARCOM-R 70-8, insure the compliance of their program with the goals and objectives established by higher headquarters. They must further distribute these goals and objectives to subordinate elements within their purview. The establishment of goals and objectives should not be limited to value engineering savings, value engineering change proposals (VECP s) received, and value engineering proposals (VEP s) generated, but should encompass all phases of the VE program effort. Other examples of program accomplishments could be personnel trained, on-site visits to contractors, management orientation sessions conducted, and VE clauses included in contracts.

b. Program goals and objectives serve as basic information input to the various planning and control actions of the total program. Thus, the program goals and objectives should be well thought out, clearly expressed and attainable, but at the same time sufficiently challenging so as to provide not only guidance but true motivation.

2-6. Publish operating procedures. a. The VEPM must clearly define the operating procedures by which the VE program should be carried out. These procedures should be written and incorporated into a procedures manual which is available to all organizations.

b. Actual content of the procedures manual should contain at least the following:

(1) The methods and procedures by which in-house VE studies are to be accomplished.

(2) Standard formats for documenting and submitting in-house VE studies.

(3) The procedure for contract price adjustment following acceptance of a Value Engineering Change Proposal (VECP) from a contractor.

(4) The procedure for routing VECP s/VEP s through the organization to insure both technical and economic feasibility review prior to a decision to approve or disapprove the VECP.

(5) The procedures for reporting VE program results required by DARCOM-R 70-8.

(6) The procedure for establishing VE participation in in-process reviews of materiel development projects.

(7) The procedures for establishing cost target programs in conjunction with materiel development projects.

(8) The procedure for the structure, operations, and steps to form and disband VE task forces.

2-7. Develop program evaluation plan. a. The program manager must be acutely aware of the current status of the VE program. The proper management of any program requires the continual evaluation of current program status against prior planning. To insure that proper evaluation of the program is actually carried out, the program manager should develop a systematic method of conducting evaluation. VE program evaluation plans should encompass the following:

- (1) The extent of compliance with established policies and directives.
- (2) The reliability and accuracy of data generated by the VE program.
- (3) The quality of performance in planning and management of the program.
- (4) The effectiveness of the program in meeting assigned goals and objectives.

b. More specific guidance on the nature of program evaluation may be found in specification MIL-V-38352 and in Chapter IV of the DOD Value Engineering Handbook, 5010.8-H. The following is a list of questions that can be used to audit a VE Program:

- (1) Does the organization have a policy statement regarding value engineering?
- (2) Are implementation procedures published and in use?
- (3) Does management exhibit a consistent and continuing interest in the program?
- (4) Are specific actions taken to "close the loop" after value engineering proposals have been generated?
- (5) Does the organization select its value engineering projects on a systematic basis?
- (6) What is the average savings-to-cost ratio achieved by the value engineering program?
- (7) Is the value engineering effort organized in an effective manner?
- (8) Is the value engineering program adequately staffed?

(9) Is management setting realistic targets for the value engineering effort?

(10) Does the value engineering reporting system accurately report the progress of the program?

(11) Are there periodic audits of the value engineering function?

(12) Is there a formal procedure for documenting and auditing savings resulting from value engineering efforts?

(13) Is management providing adequate incentives for the performance of value engineering?

(14) Are internal reviews of value engineering change proposals sufficiently detailed and analytical so as to insure a high percentage of acceptance of proposals by the customer?

(15) Are value engineering proposals given proper attention by project supervision?

(16) Does the organization use the purchasing agents' talents and experience in design reviews, hardware analysis, seminars, and task forces?

(17) Does value engineering work with the material department to search for and disseminate information on new materials, processes components, and specialty suppliers?

(18) Are value check lists included in all applicable Request for Quotations (RFQ s)? With what results?

(19) How often do the heads of value engineering activities attend value-oriented military and industrial conferences and meetings outside the organization?

(20) Does management support a value engineering training program?

(21) What is the duration of formal training seminars?

(22) What is the general reaction, comment, and criticism elicited from participants at the conclusion of the seminar?

(23) How suitable are the projects selected for seminar training?

(24) What is the spectrum of projects selected for seminars?

(25) Have accurate costs of parts, processes, materials, labor, and all other charges been obtained for seminar projects?

(26) Have worthwhile seminar proposals been implemented?

(27) Has proper funding been received for personnel time and facilities for seminar training?

(28) On what basis are full-time value engineers selected?

(29) Are house organs and bulletin boards used to publicize the program and its accomplishments?

2-8. Depot value engineering program. While the majority of this pamphlet has been written for the Value Engineering Program Managers (VEPM s) at major subordinate command (MSC s) and project managers; it is also intended to serve as a guide for depot VEPM s. Specifically, depot VEPM should be guided by the following chapters, paragraphs, and events as shown below:

Chapter 2, Value Engineering Program - paragraphs 2-2, 2-3, 2-4, 2-5, 2-6 and 2-7.

Chapter 3, Value Engineering Support Activities - paragraphs 3-1, 3-2, and 3-3.

Chapter 5, Development, Production, and Deployment Management of Systems/Items - paragraphs 5-6 and 5-12.

Chapter 6, Value Engineering Proposal Management -  
paragraph 2-1 (Events 1, 2, 3, 4, and 5)  
paragraph 6-2 (Event 6)  
paragraph 6-3 (Events 8 and 9)  
paragraph 6-4 (Events 10, 11, 12, 13, 14, and 15)  
paragraph 6-5 (Events 23, 24, 25, 26, 27, 28, and 29)  
paragraph 6-6  
paragraph 6-7

Chapter 7, Value Engineering Management During Acquisition, Operation, and Maintenance of Materiel-  
paragraph 7-2 (Events 15, 18, and 19)  
paragraph 7-3 (Events 9, 10, 11, 12, 13, 14, 15, 16, and 17)

## CHAPTER 3

## VALUE ENGINEERING SUPPORT ACTIVITIES

3-1. Management orientation program. a. The orientation of those responsible for the support of the VE program is one of the most significant aspects of the entire program. The purpose of management orientation is to create a receptive atmosphere and mutual understanding of the objectives of the program. The attendance of each member of management at one or more orientation sessions is necessary.

b. The presentation of these programs, consistent with the degree of orientation required by those in attendance, is the responsibility of the training and the VE organizations. The orientation should be a formal program that could consist of lectures, films, program learning exercises and problems and projects.

c. The factors to be considered during the management of the orientation program are:

- (1) Personnel to receive the orientation training.
- (2) Personnel responsible for conducting training.
- (3) Personnel to support the orientation program.
- (4) Topics to be included in each session. These should include the following:
  - (a) Definition of and need for VE.
  - (b) Benefits and objectives of the program.
  - (c) Top Level support being given the program.
  - (d) Techniques, methodology, the job plan, and how VE is being performed within the various organizations.
- (5) Orientation training material.
- (6) Schedule for orientation sessions.

3-2. Training program. a. Personnel that participate in the program should have VE training. These personnel include:

- (1) VE specialists.
- (2) Persons participating on VE study task forces.

(3) Persons working in areas where VE principles should be practiced (design, production, procurement, etc.).

(4) Persons working in closely allied areas (quality, reliability, maintainability, logistics, cost estimating, etc.).

b. Factors to be considered in the management of the training program are:

(1) The skills required by persons engaged in VE work. As an example, the VE specialists should:

(a) Be capable of applying the basic philosophy and techniques of VE.

(b) Possess technical competence required to analyze design, production, and acquisition functions.

(c) Know and be capable of applying the various methods of generating new and useful ideas to solve value problems.

(d) Have a working knowledge of production management.

(e) Understand the various types of contracts and incentive clauses to enable them to contribute significantly to contractual aspects of value engineering.

(f) Have an understanding of individual behavior and group dynamics to establish a receptive atmosphere for new and unusual ideas resulting from their efforts.

(g) Be familiar with cost estimating and purchasing techniques for development of effective value studies.

(2) The type of training (i.e., orientation, indoctrination, and skill development), the length of the training sessions, the course content and materials, and the on-the-job training experience.

(3) Assistance in developing training plans, furnishing spaces in courses, and coordinating training manpower and equipment requirements available from the Training Director.

(4) On-the-job training for VE specialist under the competent supervision of a skilled value engineer.

(5) Career development training in the following areas for the VE specialist:

(a) Elements of production management.

(b) Systems and cost effectiveness.

- (c) Contract types and incentive procurement.
- (d) Cost estimating and price policies.
- (e) Creativity or group dynamics.
- (f) Project planning and control techniques.

3-3. Motivation. a. The motivation of all persons to the need for and benefits of a VE program is vital. The most effective motivational methods is the person-to-person contact or the contagious atmosphere that prevails when one person is able to excite another to feel as strongly about a cause as they do. The VE specialist needs a high sense of urgency of the importance of VE and, in turn, they must be able to motivate others to feel so inclined.

b. The publicity given the VE program must be related to the people to be motivated, i.e., their interests, their jobs, their organizations, their job levels, their needs for recognition and identification. Publicity should tell people what VE means to the public, what the Government is doing in VE, and why both Government and non-Government personnel should be interested in VE.

c. Factors to be considered in the management of motivation are:

- (1) Publicity to include both educational and motivational messages.
- (2) Assistance available from the Public Affairs Office (PAO).
- (3) Publicity must inform all personnel of the existence of a formalized VE program and explain the purpose, terminology, methodology, and the goals of the program.
- (4) Interest aroused by association with the VE program through field visits and short formal presentations.
- (5) The use of news media such as television, radio, newspapers, pamphlets, bulletins, newsletters, meetings, and displays, etc., as means of providing the greatest publicity coverage.
- (6) Various awards in the form of money, letters of recognition, news accounts, and formal presentations to stimulate people to actively work for a total VE program.
- (7) An intercommand VE council to help formulate policy, to work for more publicity, to consider persons for awards, and to disseminate information.

3-4. Value engineering services. a. Every VE organization should have access to the services enumerated in this paragraph. All of these services may not be currently available, hence they will have to be developed under the VE program. Normally, the amount of time devoted to work on these services should be some percentage, such as, 5 to 10 percent of the total time devoted to all VE work.

b. Factors to be considered in the management of this program are:

(1) Establishment of a VE library to include books, handouts, specialty vendor items, Government pamphlets, handbooks, directives, instructions, procedures, specifications, etc.

(2) Development and dissemination of technical data, such as value standards, cost per function, cost of standard process or machine operations, relative costs of raw materials, tolerances and finishes, and related administrative and office costs.

(3) Maintenance of an exchange of technical and cost information with other functional groups, such as reliability, maintainability, logistics, quality, and production.

(4) Technical specialty support (VE consulting services) available to all activities.

(5) Maintenance of contacts with, and files on, specialty vendors (support to task forces and seminars).

(6) Review of technical periodicals for VE items of interest.

(7) Establishment of a speakers bureau of available speakers from Government and industry.

(8) A historical file on "before/after" VE cases with pictures and narrative summary.

(9) VE program improvement through research, through consulting service to VE research groups, and through providing support to visiting researchers.

(10) A register of trained Value Engineers.

(11) Support to professional society activities.

3-5. Subordinate element support and evaluation. a. The greatest amount of VE work is performed at the lower organization levels as close as possible to the areas where the product or service is being analyzed. The headquarters and command VEPM should supply support, guidance, management direction, and evaluation of the program at subordinate

element levels. The purpose of this program is to assure that the needed support of the subordinate element VE program is accomplished. Close contact between the headquarters, command, and the subordinate element VEPM is essential for the smooth operation of this program. The subordinate element program should be evaluated by headquarters or command level personnel. The evaluation can be accomplished by auditing the reports submitted and by on-site evaluations. The objective of the subordinate element program evaluation is to assist in improving the program and to reward persons and organizations at that level for the conduct of an effective program.

b. Factors to be considered for successful management of subordinate element support programs should include:

(1) Trips to subordinate element facilities to motivate the VEPMS, their staffs, their supervisors, and other key supervisors and people in their activities.

(2) A routine system for the expeditious dissemination of new and revised regulations, directives, and other material relative to the VE program.

(3) Interpretations by the headquarters or command VEPM of regulations, directives, and other material relative to the VE program.

(4) The handling of reports from subordinate elements including evaluation and forwarding to higher levels.

(5) Visits by the headquarters or command VEPM to subordinate element orientation and training activities.

(6) A routine system for the prompt handling of letters of commendation.

(7) Assistance from the headquarters or command VEPM in the development of subordinate elements' basic organization.

(8) Goals set by the higher level VEPM for the subordinate elements based upon their potential.

c. Factors to be considered in the evaluation of subordinate elements' programs are:

(1) A routine procedure for evaluating the program based on information contained in various reports submitted by the subordinate element.

(2) On-site evaluation of subordinate elements to include:

(a) Selection and appointment of evaluator(s).

(b) Time schedule for evaluating subordinate elements' program.

(c) Instructions for conducting evaluations.

(d) Other items as required.

(3) Evaluation criteria such as the following can assist in VE program evaluations:

(a) Organization and management support.

1. Does the organization have a strong and clear policy statement regarding VE?
2. Are adequate implementation procedures provided?
3. Do the VEPM s have access to sufficient personnel to adequately conduct their business on a timely basis?
4. Are implementation policies, procedures, and other guidelines updated to reflect current thinking in the VE area?
5. Is there a satisfactory interrelationship between VE and the other managerial elements?
6. Has the program been allotted sufficient funds, office space, and equipment?
7. Is VE applied to all program operations?
8. Does the organization select its VE projects on a systematic basis?
9. Is management setting realistic targets?
10. Does the reporting system accurately report the progress of the program?
11. Are there periodic audits of the VE function?
12. Is management providing adequate incentives for the performance of VE?
13. Does management support a VE training program?
14. Does top management openly and actively support the program?
15. Are internal reviews of VECP/VEP sufficiently detailed and analytical to insure a high percentage of acceptance?

(b) Activities of a Value Engineering Program.

1. Are VE studies conducted on a continuing basis?

2. Are the publicity efforts broad in scope and of a continuing nature?

3. Is a formal training program for VE specialists in effect? Is there a training program for personnel performing VE studies that will provide them training on VE techniques?

4. Are orientation and progress report sessions conducted for top management personnel on a continuing basis?

5. Do the VE personnel work with personnel from other disciplines when performing studies and analysis?

6. Are the VE studies conducted in a professional manner?

7. Are the concepts as embodied in "Systems and Item Selection" considered when determining study priority?

8. How much leadership is being provided by value engineers?

9. How well have accomplishments been summarized and documented as a result of systems review sessions?

10. What is the history regarding following up on worthwhile suggestions?

11. Do the VE personnel have available and make use of adequate library and related educational material?

(c) Achievements of the VE program.

1. Have cost savings goals been achieved?

2. What has been the record of locating potential projects and offering VE services?

3. Have cost avoidance targets been met on items and/or processes during design?

4. When a cost target has been set on a design, how close does the value study usually come to the target when actual costs are later tallied?

5. What is the average savings-to-cost ratio achieved by the program?

6. Have worthwhile proposals been implemented?

7. Are VECP s/VEP s processed expeditiously?

8. How many VECP s/VEP s have been submitted?

9. How many VECP s/VEP s have been accepted for implementation?
10. Are the VECP s/VEP s well documented?
11. Are the VE reports submitted on schedule?
12. How many VE studies have been completed?
13. Are the VE studies well documented?
14. Are the majority of employees VE conscious?
15. Are the training programs productive?
16. Are the correct caliber of personnel selected for VE training?
17. Are the trained personnel actively working in the VE area?
18. How many studies are in process?
19. Have VE studies been conducted in all the different functional areas of the organization?
20. Are the goals of the present and future in excess of previous annual accomplishments?

3-6. Contractor indoctrination and evaluation. a. Most of the Government development, production, and maintenance work is done by contractors. Therefore, it is imperative that contractors do VE to reduce the cost of defense materiel. The purpose of this program is to inform the contractor of the VE program; advise how it is to be applied in their contracts, the benefits they will receive from doing value engineering work, the mechanics of submitting a VECP, and to motivate the contractor's desire to perform VE. Close coordination between the Government VEPM and the contractor VEPM should be encouraged. If the contractor has a VE Program Requirements Clause in a contract, the Government personnel should be evaluating the program to assure that it meets the requirements set forth in the contract.

b. This program will require coordination with the responsible Defense Contract Administration Service Region (DCASR) VEPM. The amount of effort required will vary according to the contractual situations and the overall arrangements made between the Principal Contracting Officer (PCO) and the Administrative Contracting Officer (ACO) for handling the contract. Accordingly, management actions in regard to this program should reflect support requirements and responsibilities of DCASR as related to specific contracts.

c. Factors to be considered in applying the management process in this program are:

(1) Provisions for providing indoctrination to all major contractors that are the responsibility of the VEPM. The indoctrination should cover definition, benefits, approaches, review of VE contract requirements, and the mechanics of getting changes approved. The indoctrination session should be at least a 2-4 hour presentation at the contractor's plant. These presentations should be supported by the VEPM, the DCASR Value Engineering Program Monitor, the Contracting Officer, and, as appropriate, the procurement and development engineering personnel. As a minimum, the session should include the following:

(a) The principles and applications of VE, including methodology and the benefits.

(b) The opportunity the VE clause offers the contractors for increasing their profits.

(c) The Government processing of the contractor's VECP s and the need for the contractor to submit factual and complete proposals.

(d) The format for submission of VECP s.

(e) Specific discussion of the VE cause contained in the contract.

(2) Trips to contractor's facility for motivational purposes.

(3) Provision for reviewing contract negotiation action for elements of contractor indoctrination and motivation.

(4) Effective evaluation of a contractor's VE program requires the evaluator to determine that the contractor's written procedures and work instructions adequately cover the following elements of the system; i.e., does the contractor documentation provide:

(a) For a plan that assures that actions that may effectively contribute to a successful VE program are considered and implemented?

(b) For a method that assures expeditious handling at VECs?

(5) To complete the evaluation of the contractor's VE program, the evaluator must determine if the documented procedures and work instructions are being complied with utilizing the following criteria:

(a) Does contractor documentation provide for a plan that assures that actions that may effectively contribute to a successful VE program are considered and implemented, such as:

1. Identifying the organization and persons responsible for conducting a successful VE program?

2. Determining the qualifications to be used for hiring the key individual who will manage the VE activity?

3. Identifying the staffing requirements of the VE organization?
  4. Identifying the technical requirements for selecting a project for VE study?
  5. Outlining the steps to be followed for conducting and implementing VE studies?
  6. Identifying high cost items to be selected for VE study?
  7. Reviewing subcontractor/vendor products for VE study?
  8. Identifying a cadre of trained VE persons to be used on VE projects?
  9. Identifying funds to be used for VE projects?
  10. Establishing priorities for funding VE projects which reflect relative potential VE savings?
  11. Identifying the requirements for a VE training program?
  12. Scheduling a series of VE training seminars?
  13. Identifying the persons responsible for conducting VE training?
  14. Identifying the resources to be used for VE training?
- (b) Does contractor documentation provide for a method that assures expeditious handling of VECs?
1. Describing the flow process to be used for handling VECs?
  2. Identifying the difference in the manner of handling VECs and regular ECs?
  3. Outlining the follow-up activities needed to assure that a VEC is constantly being handled in an expeditious manner?

## CHAPTER 4

## VALUE ENGINEERING MANAGEMENT DURING MATERIEL LIFE CYCLE

## SECTION I. MATERIEL LIFE CYCLE PROGRAM

4-1. Development, production and maintenance management. a. The VE program for development, production and maintenance management is to insure that all systems or items of materiel have a well designed and successfully operating program for accomplishing VE during the materiel life cycle.

b. A VE program during development will assure that VE work is being accomplished early where the greatest savings will be realized. In addition, a successful program will prevent low value items from being designed, developed, produced, and entered into the military supply system. The cost of making VE changes are much less if made during development than later during production where tooling, drawings, manuals, and specifications changes are necessary, and where retrofit and retesting may be necessary. In some instances where small production quantities are procured there is little or no time to do VE. VE has often been practiced only in production, whereas the greatest benefits and savings will occur if VE is accomplished during development.

c. The rapid advances in materials and process technology are continuing to develop newer and better ways to accomplish a function at less cost. Thus, there is a real need to do VE during all the phases of the materiel life cycle. The savings realized by doing VE in the later phases may not be as spectacular as those achieved during development, but they are just as necessary to assure that high value defense materiel is being procured.

d. Detailed descriptions of the various development, production, and maintenance management events are contained in chapter 5 of this pamphlet. The support program that pertains to the performing of VE studies, the preparation, submittal, and review of VECPS/VEPS is contained in chapter 6 entitled "Value Engineering Proposal Management." The second support program that pertains to the contractual aspects of managing a VE program and auditing and managing VE is contained in chapter 7 entitled "Value Engineering Management During Acquisition, Operation, and Maintenance of Materiel." Brief introductory material on these two programs will be found in paragraphs 4-1 and 4-2 in this chapter.

e. Figure 1 shows the broad relationship between development, production and maintenance management; proposal management; and acquisition, operation, and maintenance management.

f. Development and production of new systems or items of materiel may be accomplished entirely by Government facilities, entirely by contractor facilities, or by a combination of Government and contractor facilities. Under any of the above three methods of operation, the Government VE personnel

have VEPM tasks to perform. Chapter 5 describes the VE events for the situation where the development, production and maintenance effort is to be accomplished completely by Government activities and for the situation where the effort is to be accomplished completely by contractor activities. If the work is to be performed by a combination of Government and contractor activities, appropriate events will have to be selected from both sections I and II of chapter 5.

## SECTION II. LIFE CYCLE SUPPORT PROGRAMS

4-2. VE proposal management. a. The objective of all VE programs is to generate VE studies (or change proposals) that will save the Government money. Benefits of an active proposal management program are reduced costs of materiel and services, item simplification, greater productivity, and more reliable high quality materiel.

b. A VEP can originate within a Government activity and a VECF with a defense contractor's activity. Time and resources are required to develop the VECF/VEP and to review it. All VECFs and VEPs must be reviewed by Government personnel prior to being accepted and implemented, or disapproved.

c. Factors to be considered in the management control of the proposal cycle are:

- (1) Selection of items for VE study projects.
- (2) Determination of resource requirements for developing and processing VECF s/VEP s and for scheduling the performance of studies.
- (3) Control of VE study team activities.
- (4) Route, schedule, and control of the processing of VECFs/VEPs.
- (5) Performance of economic, technical, or management evaluations on each VECF/VEP.
- (6) Conduct of a final review evaluation on each disapproved VECF/VEP.
- (7) Evaluation of the VE proposal management program.
- (8) Handling of in-house suggestions from Government specialists and the Army Suggestion Program.
- (9) Computation of values for:
  - (a) Present and proposed method costs.
  - (b) Implementation costs.

- (c) Quantity requirements for present and/or future acquisitions.
  - (10) Computation of target and estimated values for the VECP/VEP for:
    - (a) Estimated savings.
    - (b) Cost avoidance savings.
    - (c) Present method quantity requirements.
    - (d) Implementation costs.
  - (11) Compilation of reporting and evaluation data for:
    - (a) Validated present and proposed method costs.
    - (b) Validated present quantity requirements.
    - (c) Future acquisition quantity requirements.
    - (d) Target and estimated values on:
      - 1. Estimated savings.
      - 2. Cost avoidance savings.
      - 3. Implementation costs.
    - (e) Validated estimated savings.
  - (12) Minimum information requirements of a VECP/VEP.
  - (13) Minimum information requirements for auditing a VECP/VEP.
  - (14) VECP/VEP record format, file format, and file maintenance procedures.
- 4-3. Acquisition, operation and maintenance management. a. The efficient management of all phases of the materiel life cycle from contract requirements and incentives through contract adjustment and payments is necessary to realize the fullest benefits of the VE program.
- b. Factors to be considered in the management control of the acquisition cycle are:
- (1) Selection of validation phase VE program planning proposal requirements.
  - (2) Evaluation of validation phase VE program planning proposals.

# MATERIEL LIFE CYCLE MANAGEMENT

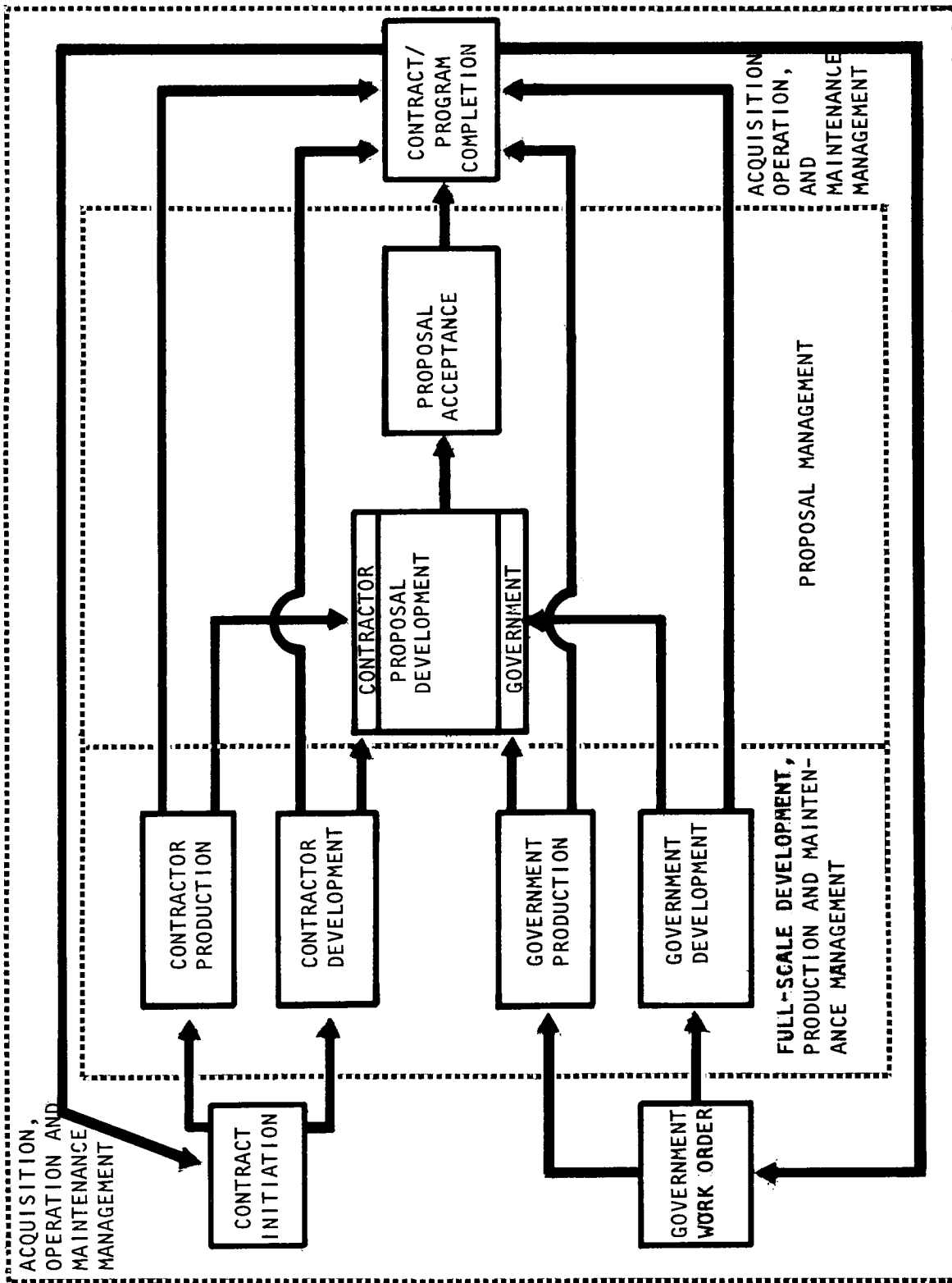


FIGURE 1

- (3) Formulation of development phase VE plan.
- (4) Negotiation of development contract VE elements.
- (5) Evaluation and performance of VE program audits for materiel programs:

- (a) Government development and production.
  - (b) Contractor development and production.
- (6) Evaluation of contract management program.
- (7) Review of pending royalty obligations.
- (8) Contract adjustments.
- (9) Computation of:
  - (a) Realized savings.
  - (b) Realized and estimated follow-on savings.
- (10) VE program and savings reports.

c. Factors to be considered in the management control of the operation and maintenance cycle are:

- (1) Formulation of operation and maintenance VE plan.
- (2) Evaluation and performance of VE program audits during the operation and maintenance cycle.
- (3) Computation of:
  - (a) Realized savings.
  - (b) Realized and estimated follow-on savings.
- (4) VE program and savings reports.

## CHAPTER 5

## DEVELOPMENT, PRODUCTION AND MAINTENANCE MANAGEMENT OF SYSTEMS/ITEMS

## SECTION I. GOVERNMENT ACTIVITIES

5-1. Program events. Figure 2 shows the sequence of life cycle phases and program events when the development, production and operations/maintenance management is to be accomplished completely by the Government.

5-2. Conceptual phase.

Event 1. Operational requirements reviews. a. The operational requirements or research and development project authority documents, e.g., System Specification (per AR 70-1) should be reviewed from a value engineering viewpoint. This means that these documents must be studied to determine whether the system/item requirements specified are too rigid (i.e., nice-to-have, but unnecessary).

b. The development agency value engineer reviewing the documents must be prepared to estimate the change in cost resulting from overspecification. The cost data will allow decision makers to decide whether the additional requirement is worth the cost trade-off in order to meet a design-to-cost target as specified in the reviewed documents.

5-3. Validation phase.

Event 2. VE requirements for full-scale development.

a. The responsible VEPM should require from the development agency (Government command, laboratory, etc.) a plan for the accomplishment of VE work during full-scale development. The responsible manager could be any one of the following individuals:

- (1) VEPM, subordinate command management.
- (2) VEPM, project (program) management.
- (3) VE coordinator, project (program) management.

b. This plan should be prepared by the development agency program manager along with assistance from development and test and evaluation personnel. The information shown in table 1 should be required from the development agency.

Event 3. Initial VE plan for full-scale development. The development agency VEPM should prepare a plan for accomplishing VE work during full-scale development. The plan should include all of the items required by the responsible VEPM (Event 2), and should be submitted at least one month prior to the start of engineering development.

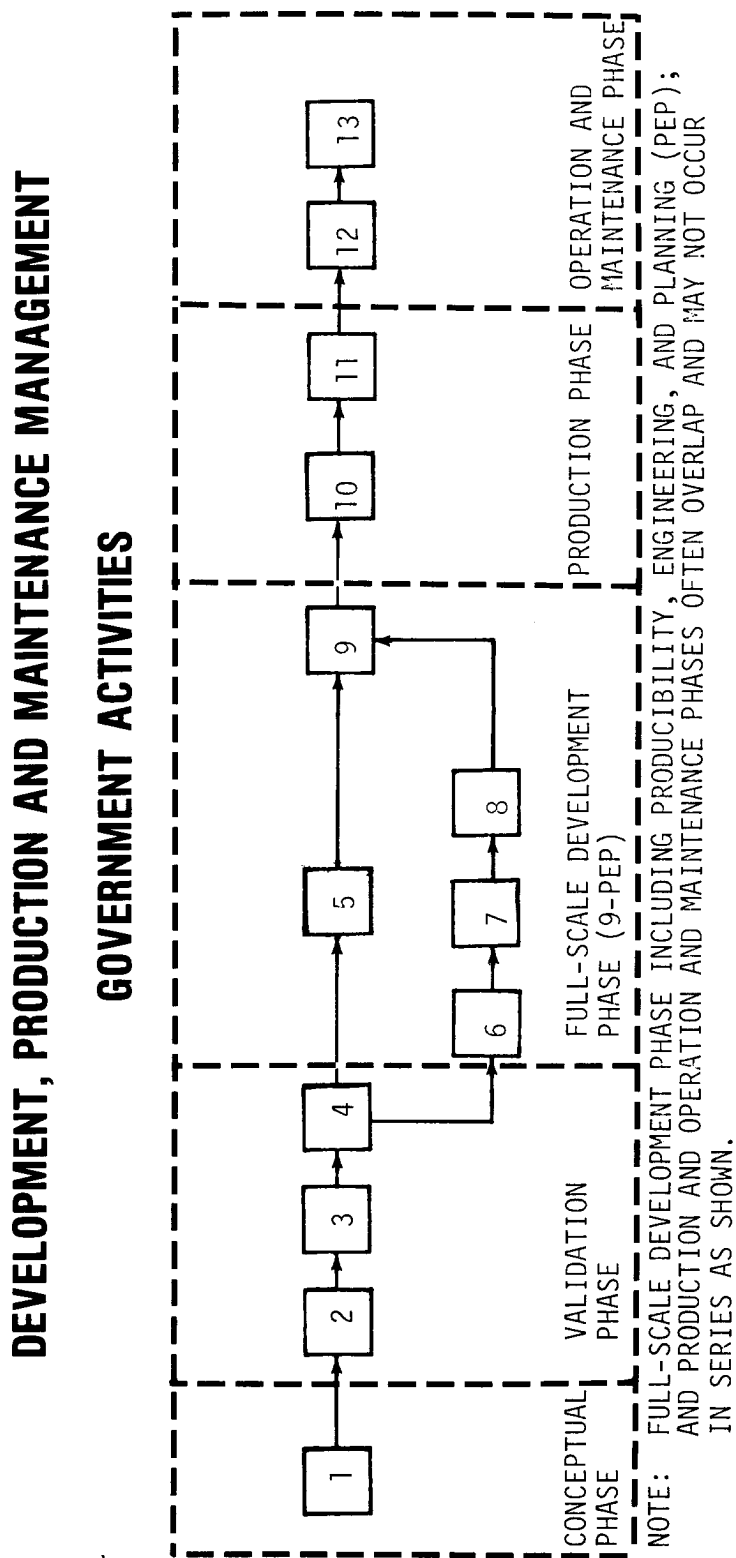


FIGURE 2

Event 4. Final VE plan for full-scale development. The final plan for accomplishing VE during full-scale development should insure that the proper level of VE effort will be concentrated on those parts of the system/item that will result in the greatest benefits throughout the full-scale development phase including test and evaluation. The plan may be a refinement or a revision of the development agency's initial plan. In all cases, the final plan should include the items shown in table 1.

#### 5-4. Full-scale development phase.

Event 5. VE during full-scale development. VE work is not easy to accomplish during full-scale development because firm designs do not exist until late in the development phase. However, VE work applied to a design will be much more effective and fruitful than if it is applied when the item enters the production phase. Several methods used to successfully accomplish VE during full-scale development are:

a. Design-to-cost. This program gives each design, development, and test engineer a cost target to adhere to in the development process. The program must provide a unit cost target for each development area as well as the means of tracking the costs of alternatives so that the designer (development engineer) can make economic decisions relative to the various designs. Cost targets may be established by using the value engineering job plan techniques, by reducing cost estimates a set percentage, or by using one of the four basic techniques of estimating. They are analogy, statistical prediction, engineering method, and expert opinion. The technique used is mostly dictated by the type of data available, the current status of the item being estimated, the expertise available, and the time constraints. Most estimates will be derived using combinations of these approaches and are briefly described as follows:

(1) Analogy -- this approach is based upon the application of previous experience to a current problem. It seeks features of prior systems or items and likens these cost experiences to similar systems and components now under development and production.

(2) Statistical prediction (parametric estimate) -- can be viewed as a special form of analogy that is characterized by the use of analytical techniques applied to the analogue system costs. While there are many well-known statistical tools of use for specific situations, one of the most commonly used in cost estimating is regression analysis.

(3) Engineering method -- each component making up to the total system is individually costed by engineering judgment of labor, materials, overhead, tooling, etc., costs expected for the component. The term "engineering judgment" implies that time is a sound basis for each factor such as engineered labor standards and standard costing data.

## VALUE ENGINEERING PROGRAM

### INFORMATION REQUIRED AND EVALUATED

TABLE 1

EVENT

INFORMATION	2	4	9	10	12
1. DESIGN-TO-COST TARGET	X	X			
2. SPECIFIC PARTS OF THE SYSTEM/ITEM HAVE BEEN SELECTED FOR VALUE STUDY.	X		X	X	X
3. OUTLINE OF HOW SPECIFIC VE TASKS WILL BE PERFORMED.	X	X	X	X	X
4. PROJECTION OF RESOURCES (MANPOWER AND MONEY) NECESSARY TO MEET SCHEDULE.	X		X	X	X
5. ESTIMATE OF RESOURCES NECESSARY FOR VE WORK.		X			
6. PROPOSED SCHEDULE FOR STUDIES AND OTHER VE TASKS.			X	X	X
7. SCHEDULE FOR ACCOMPLISHING STUDIES (PROPOSALS) AND OTHER VE TASKS.			X	X	X
8. PROPOSED METHOD OF IMPLEMENTING STUDIES.			X	X	X

(4) Expert opinion -- this approach, sometimes called the "technical estimate," entails the use of expertise available in a specialized area. It is an opinion from authoritative personnel who represent the best source of knowledge available to the estimator.

b. Development department value engineers. Value engineers are assigned to act as value consultants to the development organization. They would supply the design engineers with alternative lower cost ways of providing the required function. Thus, they assist the designer to develop lower cost (better value) products in less time.

c. Value trained development engineer. This method advocates that all development and test engineers receive value engineering training so they will practice good value concepts in their development work.

d. Value engineering studies (proposals). This method involves actually performing a VE study on an initial design or test procedure before the design is finalized. Normally, a value engineer would act as task force leader over several (5 or 6) studies all taking place simultaneously. Planning for this event has taken place under event 4. Implementation is the actual performance of VE studies (see chapter 6, Value Engineering Proposal Management). Reporting is the monthly report submitted by the responsible task force leader or value engineer to the VEPM of the development agency. The development agency program manager must analyze and evaluate the progress of the various VE projects and take the necessary correction action. Some of the types of corrective action are as follows:

(1) Obtain additional resources of manpower and money to speed up progress on present projects.

(2) Drop certain low productive studies (or projects) and start new studies that appear to have higher potential.

(3) Reschedule the completion of certain projects.

(4) Analyze the various systems/items under study and select different systems/items that appear to have higher cost reduction potential.

(5) Change the priorities of studies along with changes in resource assignments.

Event 6. Design characteristics review. a. The design documents (drawings, specifications, standards, etc.) should be reviewed by the development agency value engineer to assure that materiel simplification and economic aspects have been considered in the design of the system/ item. In addition, the reviewer should make recommendations for the elimination of requirements that lead to nonessential features. Some aspects of cost to be considered during this value design review are:

(1) Identification of an initial cost target for each design "package."

(2) Comparison of a cost estimate for each design alternative with the cost target.

(3) Establishment and discharge of responsibility for cost control.

(4) Determination of the prices and price breaks of purchased parts.

(5) Solicitation of cost reduction ideas from design review team participant.

(6) Functional analysis of the design requirement and the design alternatives.

b. At the time of this design review, the value engineer should have a concise summary of up-to-date events and projected goals for the remainder of the program. Specifically, this summary should include:

(1) Existing and potential problem areas and recommendations for their solution.

(2) Completed and in-process value engineering studies.

(3) A functional analysis of the item.

(4) A list of high cost areas and specific recommendations for minimizing cost.

(5) Cost target data on the item.

(6) Predicted cost estimates of the alternative approaches under consideration.

c. To assist in this design characteristic review, the value engineer should use a value check list to assure that all elements or parts of the system/item have been or will be designed for minimum cost. Check lists may need to be structured for the particular type of product to which they will be applied. The following are some possible checklist elements:

(1) General.

(a) Have the specifications been critically examined?

(b) Has the cost of any overdesign been defined for its effect on research and development, production, and operation and maintenance?

(c) Has the cost effect of required overdesign been discussed?

(d) Has the field of commercially available packaged units, subassemblies, and circuits been considered?

(e) Have suggestions been invited from prospective suppliers regarding possible value improvement from loosening specification limitations?

(f) Does the design give the user what he needs and no more?

(g) Could costs be radically reduced by a reduction of performance, reliability or maintainability?

(2) Parts Selection and Evaluation.

(a) Have appropriate standards been reviewed for selection of standard components?

(b) Can a redesign omit a nonstandard part or replace it with a standard part?

(c) Have all nonstandard parts been identified and approved?

(d) Has the design been coordinated with similar designs, circuits, parts, or components to benefit from past experience?

(e) Do the standard circuits, standard components, and standard hardware embrace the lowest cost standards which will supply the minimum required characteristics?

(f) Can any new nonstandard part be replaced by a standard part which has already been approved?

(g) Do control drawings clearly specify a standard part when such is intended?

(h) Has standardization been overemphasized?

(3) Specifications.

(a) Is the specification essential?

(b) Is its resultant cost effect upon the product comparable to the worth of the benefits gained by the specification?

(c) Is each specified requirement essential?

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(d) Is the resultant cost effect of the magnitude of each needed requirement comparable to the worth of the benefit gained?

(e) Is the resultant cost effect of the tolerance specified on each requirement comparable to the worth of the benefit gained?

(f) Is the resultant cost effect of each referenced or incorporated specification comparable to the worth of the benefits derived? (The referenced specifications that are major cost contributors may also need to be reviewed part by part as above.)

d. The design characteristics review often results in a revision of the value engineering plan.

Event 7. Prototype system review. a. The prototype system review is similar to the design characteristics review. This review is to assure that unnecessary functions, unrealistic requirements, or poor value items or components, practices, or policies do not exist. During this review, quality assurance personnel should review the prototype system to assure that the new system has the necessary quality. Thus, this review process must maintain proper balance between performance, time, cost, quality, etc.

b. At the time of the prototype system review, the development agency value engineer should have available all information on the system/item. Since the system/item characteristics are fairly definitive at this point in time, the review process should be more detailed than the design review. As in the design review, specifically structured checklists should be used. The reviewer should recommend the elimination of nonessential feature.

Event 8. Review prior to producibility engineering and planning (PEP). The development agency value engineer should review the design package (drawings, specifications, test reports, special tools and test equipment, proprietary items, development type materiel notes, etc.) to assure that good value has been applied to the entire system/item. This review is similar to the prototype system review except that this review is more detailed than the former one. The review occurs after development (including test and evaluation) and prior to producibility engineering and planning the system or item for production. Specifically structured value checklists should be developed and used to assure that all elements of the review have been considered.

Event 9. VE during producibility engineering and planning in the full-scale development phase. A plan for conducting VE studies on specific parts of the system/item during PEP prior to production should be prepared. The information shown in table 1 should be included in the plan. The implementation phase of the plan is the actual performance of VE studies (see chapter 6, Value Engineering Proposal Management) on both product and process.

#### 5-5. Production phase.

Event 10. Production value engineering planning. a. Initial planning must be completed prior to the start of production. The production organizations' program managers should prepare detailed initial plans for accomplishing value engineering study work during the time the item/system is in production. The information shown in table 1 should be included in this plan.

b. The detailed initial production VE plan should be submitted to the next higher level VEPM by the time the work order for production is completed.

c. Detailed follow-on VE program planning should be completed, generally each year, while the item/system is in production. The detailed yearly VE program plan for the item/system should include the information shown in table 1.

Event 11. VE during production. This event assures that VE studies of both product, process, and procedures are taking place in the production phase. Planning for this event has taken place under Event 10. Implementation phase is the actual performance of VE studies (see chapter 6, value engineering proposal management). Reporting is the monthly report submitted by the responsible task force leader or value engineer to their VEPM. The production organization VEPM must analyze and evaluate the progress of the various VE projects and take the necessary corrective action. Types of corrective actions would be the same as those enumerated for Event 5, paragraph 5-4.

#### 5-6. Operation and maintenance phase.

Event 12. Operation and maintenance VE planning. a. Initial planning must be completed prior to the start of item/system deployment. The maintenance organization should prepare detailed initial plans for accomplishing value engineering study work while the item/system is undergoing initial deployment. The information shown in table 1 should be included in this plan.

b. The detailed initial maintenance VE plan should be submitted to the next higher level VEPM by the time the item/system is completed.

c. Detailed follow-on VE program planning should be completed, generally each year, while the item is operational. The detailed yearly VE program plan for the item/system should include the information shown in table 1.

Event 13. VE on maintenance functions. This event assures that VE studies of both maintenance process and procedures are taking place during the operational phase. Planning for this event has taken place under Event 12. Implementation phase is the actual performance of VE studies (see chapter 6, value engineering proposal management). Reporting is the monthly report submitted by the responsible task force leader or value engineer to their VEPM. The maintenance organization VEPM must analyze and evaluate the progress of the various VE projects and take the necessary corrective action. Types of corrective action would be the same as those enumerated for Event 5, paragraph 5-4.

## SECTION II. CONTRACTOR ACTIVITIES

5-7. Program events. Figure 3 shows the sequence of life cycle phases and program events necessary when the development, production, and maintenance management is to be accomplished completely by the contractor.

5-8. Conceptual phase.

Event 1. Operational requirements review. This event is performed by Government personnel. The event description is exactly the same as for Event 1 of paragraph 5-2.

5-9. Validation phase.

Event 2. Initial validation phase (sub-phase A) (VE program planning proposal) requirements. This event is a contract management event performed by Government personnel. The event description is contained in chapter 7, paragraph 7-2, Event 2.

Event 3. Contractor prepares validation phase (sub-phase A) VE proposal. This event is performed by the contractors in response to Event 2, validation phase VE proposal requirements. They prepare the

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VE portion of their validation phase proposal in response to the request for proposal (RFP).

Event 4. Initial validation phase (sub-phase A) (VE program planning proposal) evaluations. This event is a contract management event performed by Government personnel. The event description is contained in chapter 7, paragraph 7-2, Event 5.

Event 5. Validation phase (sub-phase B) (VE Plan) Requirements. This event is a contract management event performed by Government personnel. The event description is contained in chapter 7, paragraph 7-2, Event 6.

Event 6. Contractor prepares validation phase (sub-phase B) VE proposal. This event is performed by the contractors in response to Event 5, validation phase (sub-phase B) VE proposal requirements. They prepare the VE portion of the validation phase proposal.

Event 7. Validation phase (sub-phase B) (VE Plan) Evaluation. This event is a contract management event performed by Government personnel. The event description is contained in chapter 7, paragraph 7-2, Event 9.

Event 8. Validation phase (sub-phase C), final VE plan formulation. This plan may be a refinement of the best features found in the various proposals or a revision of the development agency's initial plan. In all cases, the final plan should include:

- a. A design-to-cost target.
- b. A schedule for VE studies (proposals) and other tasks to be performed during the full-scale development phase.
- c. An estimate of resources necessary for the VE work to be performed during the full-scale development phase.

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d. An outline of how specific VE tasks will be accomplished during the full-scale development phase.

5-10. Full-scale development phase.

Event 9. Full-scale development phase contract award. This event is a contract management event performed by Government personnel. The event description is contained in chapter 7, paragraph 7-2, Event 12.

Event 10. Contract VE work during full-scale development. The contractor performs VE studies and submits progress reports as specified in the contract schedule. The contractor program will be as specified in the contract and as a minimum will meet the requirements of MIL-V-38352 if program requirement clauses are written into the contract. The program should use as a guide the program formulated under Event 8. VECs could be submitted during the early part of the full-scale development effort if the changes that are proposed would change the scope of work of the development program, i.e., would change system/item specified requirements. Otherwise VEC's pertaining to specific designs, products, or production process changes cannot be submitted until after the product baseline has been established. These change proposals will have to move through proposal acceptance as outlined in chapter 6, section II.

Event 11. Government monitors and analyzes progress of contractor's program. Guidance on the management features will be found under Event 5, paragraph 5-4. Aspects of chapter 6 value engineering proposal management, are applicable to this event.

Event 12. Design characteristics review. Guidance on this review will be found under Event 6, paragraph 5-4.

Event 13. Prototype system review. Guidance on this review will be found under Event 7, paragraph 5-4.

Event 14. Review prior to producibility engineering and planning. Guidance on this review will be found under Event 8, paragraph 5-4.

Event 15. VE producibility engineering and planning plan.

a. If a VE program requirements clause is to be included in the PEP part of the full-scale development phase contract or if the development agency VEPM chooses to advise the contractor on areas of potential for VE study, this event is applicable.

b. A plan for conducting VE studies on specific parts of the system item during PEP prior to production should be prepared. For the information to be included in the plan, see Event 9, paragraph 5-4.

Event 16. Producibility engineering contract award. This event is a contract management event performed by Government personnel. The event description would be similar to Event 12, paragraph 7-2, chapter 7.

Event 17. Contractor VE work during producibility engineering. The contractor performs VE studies and submits VECPs as described in chapter 6, value engineering proposal management. If a VE program requirement clause is written into the contract, the contractor must submit progress reports as specified in the contract schedule. The manager (especially true if the contract contains VE program requirements clauses) should use as a guide the program formulated under Event 15.

Event 18. Government monitors and analyzes progress of contractor's program during PEP. Similar to Event 11.

#### 5-11. Production phase.

Event 19. Production VE planning. For information to be included in the plan, see Event 10, paragraph 5-5. The above plan should be completed prior to the award of the production contract, or prior to the start of production.

Event 20. Production contract award. This event is an acquisition management event performed by Government personnel. The event description is contained in chapter 7, paragraph 7-2, Event 19.

Event 21. Contractor VE work during production contract. The contractor performs VE studies and submits VECPs as described in chapter 6, value engineering proposal management. The program formulated under Event 19 can be used as a guide for this event, however, since the contractors are performing under a VE incentive clause, and/or program requirements clause, they are not in any way contractually obligated to perform according to the program of Event 19.

Event 22. Government monitors contract or VE program. The Government VEPM should work closely with the contractor to assure that the program is operating satisfactorily. Aspects of chapter 6, value engineering proposal management, are applicable to the event.

Event 23. Government VE work during production. The Government VEPMs should assure that VE studies of both product, process, and procedures are taking place in the production phase. They should make sure that Government personnel are not making VE studies on items/systems and duplicate studies being made by the contractor. Close liaison with the contractor should insure that duplication does not occur. Planning for this event has taken place under Event 19. For more information on implementation, evaluation, reporting and corrective action, see Event 11, paragraph 5-5.

#### 5-12. Operation and maintenance phase.

Event 24. Maintenance VE planning. For information to be included in this plan, see Event 12, paragraph 5-6. The above plan should be completed prior to the award of the maintenance contract or prior to the start of item/system deployment.

Event 25. Maintenance contract award. This event is a acquisition management event performed by Government personnel. This event description is contained in chapter 7, paragraph 7-2, Event 19.

Event 26. Contract VE work during maintenance contract. The contractor performs VE studies and submits VECs as described in chapter 6, value engineering proposal management. The program formulated under Event 24 can be used as a guide for this event, however, since the contractors are performing under a VE Incentive Clause, and/or a Program Requirement Clause, they are not in any way contractually obligated to perform according to the program of Event 24.

Event 27. Government monitors contractor VE program. The Government should work closely with the contractor to assure that the program is operating satisfactorily. Aspects of chapter 6, value engineering proposal management, are applicable to this event.

Event 28. Government VE work on maintenance functions. The Government's VEPs should assure that VE studies of both maintenance process and procedures are taking place during the operational phase. They should make sure that Government personnel are not making VE studies on items/systems that duplicate studies being made by the contractor, if applicable. Close liaison with the contractor should insure that duplication does not occur. Planning for this event has taken place under Event 24. For more information on implementation, evaluation, reporting and corrective action, see Event 13, paragraph 5-6.

## CHAPTER 6

## VALUE ENGINEERING PROPOSAL MANAGEMENT

## SECTION I. VE PROPOSAL DEVELOPMENT PLAN

6-1. VE project selection phase. Figure 4 shows the sequence of events in this phase.

Event 1. VE suggestion submitted to VEPM. Suggestions from various sources are routed to the VEPM for review.

Event 2. VE suggestions reviewed. Suggestions are reviewed to determine if they lend themselves to VE study.

Event 3. VE suggestion rejected. If the suggestion does not lend itself to VE study, it is rejected.

Event 4. Selection of items for VE study. All systems, major items, and major components should be selected and ranked for their VE potential. Selection and ranking methods that can be used are relative cost ranking, ABC analysis, and modified ABC analysis. This selection and ranking is intended to provide the VE program managers with a tool whereby they can predict future number of VE studies needed and the importance of each study. This forecast leads to an estimate of how much time (in man-hours) and money (funding) will be needed for each study. The process mentioned above is necessary to assure that effort is being concentrated on those systems or items that will result in greatest economic benefit for the time and effort expended. The selection and ranking process must include provisions for adding or deleting items and reassigning priorities at frequent intervals.

Event 5. Planning and organizing for VE study projects. a. The study projects should be selected based upon the priorities established under Event 4. Study projects can be conducted on items of materiel, major test specifications or procedures, items of test equipment, major maintenance specifications or procedures, and production processes.

b. Planning for the conduct of the VE study should include the items listed below:

(1) Budget for the study - The plan should establish an arbitrary figure to designate the amount of time and money that it is economically feasible to spend on a VE study. Budgets, currently for conducting a study have been established at C.5 percent of the development cost or the production cost or the project cost.

(2) Personnel - The skill levels of the people to be assigned to do VE studies.

**PROPOSAL DEVELOPMENT PLAN**  
**PROJECT SELECTION PHASE**

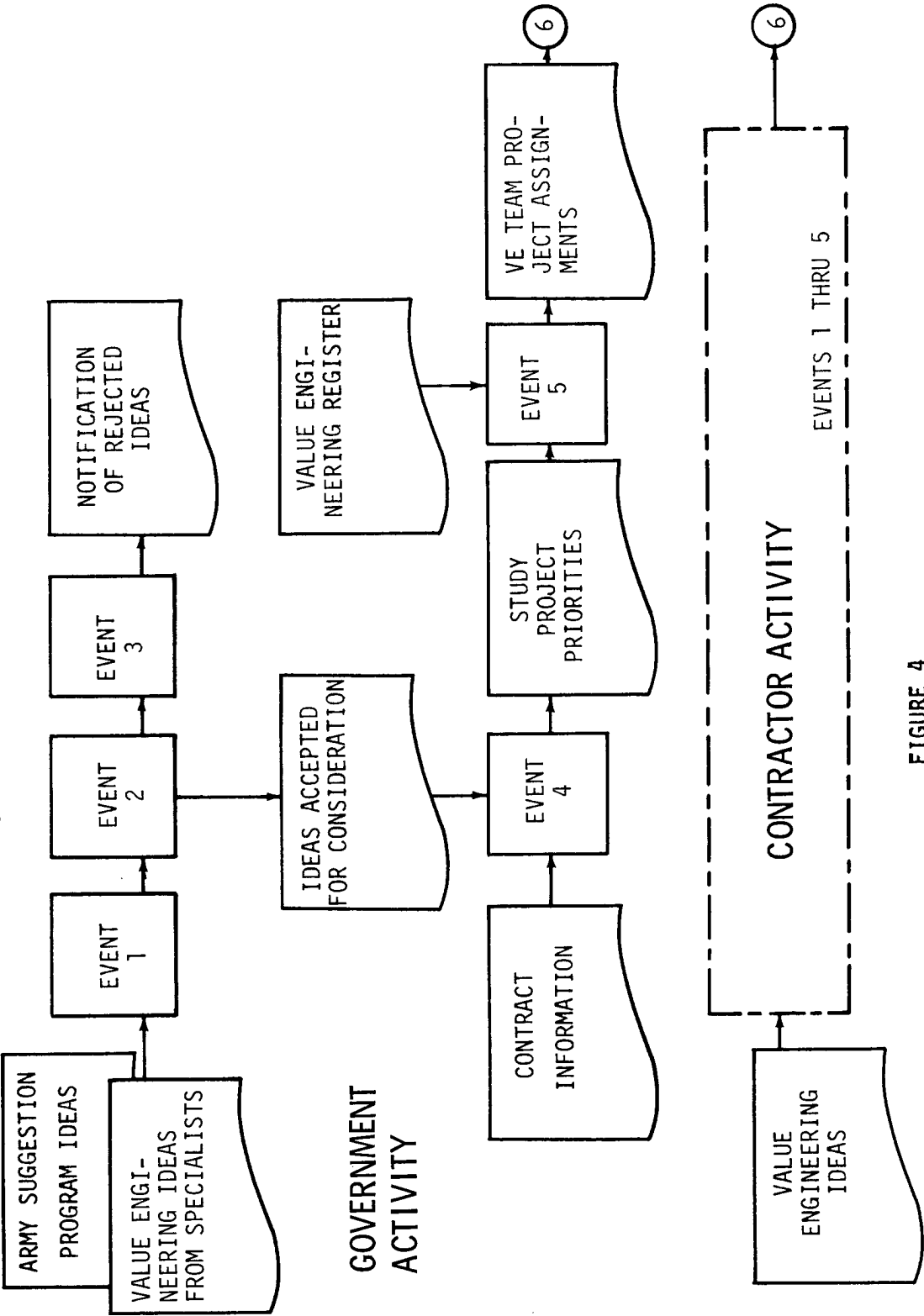


FIGURE 4

(3) Number of studies being conducted at any one time - This will be determined by the number of people that can be made available to perform the study. Generally, a technically qualified value engineer can participate in 5 or 6 individual studies (as a task force member) simultaneously.

(4) Scheduling of studies - In scheduling studies, consideration must be given to the following items:

- (a) Number of personnel involved in and available for VE studies.
- (b) Number of studies to be conducted at any one time.
- (c) Size of budget.
- (d) Priority of study.

(e) Higher headquarters due dates on study results. Individual studies should be scheduled using estimated start and completion dates.

(5) Report of study progress - This should include the means of reporting on the status of VE studies still in process. The plan should include provisions for updating every three months by deleting old items and by adding new items.

6-2. VE project study phase. Figure 5 shows the sequence of events in this phase of the proposal development plan.

Event 6. Perform VE study. VE studies can be performed by individuals or a study team per plan developed under Event 5. The studies performed according to the VE job plan (see DOD Value Engineering Handbook, 5010.8H and/or DA Pamphlet 5-4-5, VE Handbook) should result in the preparation of a VEP or a VECP.

## SECTION II. VE PROPOSAL EVALUATION AND ACCEPTANCE PLAN

6-3. VEP and VECP presentation phase. Figure 6 shows the sequence of events in VEP or VECP presentation phase of the proposal acceptance plan.

Event 7. Contractor VECP reviewed by the production representative from the administrative contracting organization. A representative from the production management department of the administrative contracting organization reviews the contractor's VECP to determine whether savings predicted by the contractor are reasonable and also to determine the impact of the proposed change on the production delivery schedule. The Administrative Contracting Office (ACO) forwards these comments to the Principal Contracting Officer (PCO) to serve as information in the PCO's total evaluation of the VECP.

Event 8. VEP/VECP presentation and review. The VE Program Manager's Office prepares a record of each VEP or VECP with information about the

**PROPOSAL DEVELOPMENT PLAN**

**PROJECT STUDY PHASE**

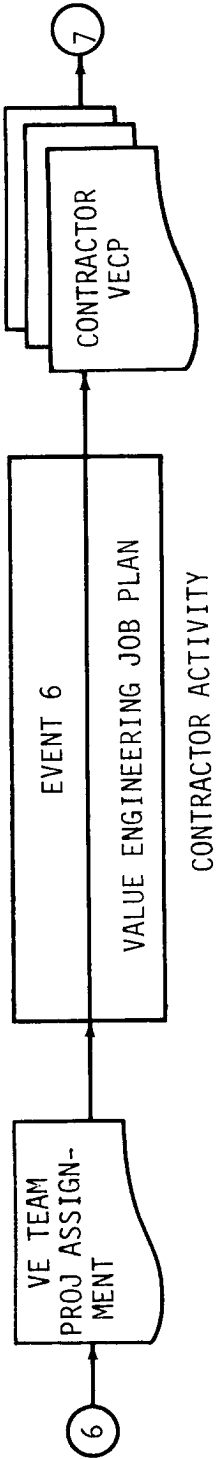
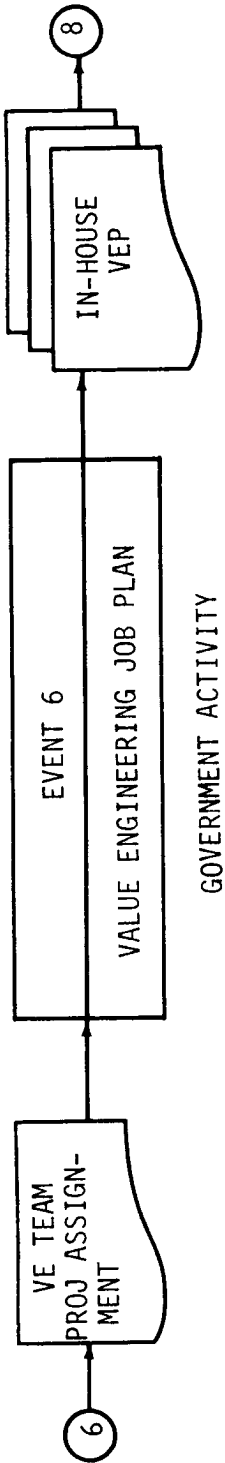


FIGURE 5

**PROPOSAL ACCEPTANCE PLAN  
VEP OR VECP PRESENTATION PHASE**

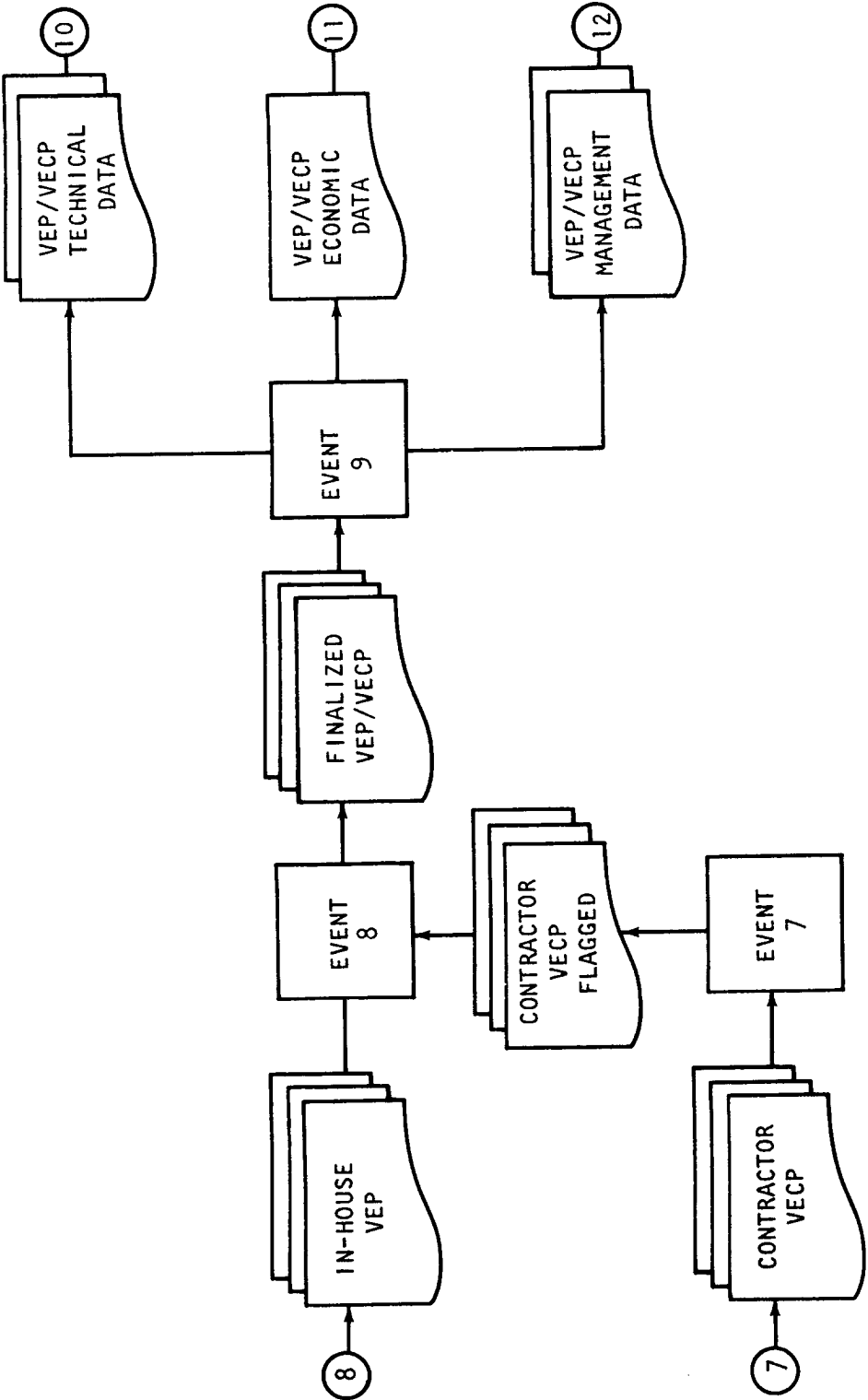


FIGURE 6

content of the VEP or VECF, whether the VEP is a Government generated one; or whether the VECF is a contractor generated one. The VEPs or VECFs should be reviewed by the VEPM and the technical evaluation activity to determine that:

a. The minimum information is included in the VEP or VECF (as a guide see the VE section of the Defense Acquisition Regulation (DAR)).

b. That the VEP or VECF is organized and formulated to facilitate its review by the evaluators.

Event 9. Evaluation and routing #1. The function of this event is to prepare the initial routing of the VEP or VECF through the remaining processing steps of proposal acceptance. Rules and routing criteria are contained in table 3, paragraph 6-7.

6-4. VEP or VECF proposed evaluation. Figure 7 shows the sequence of events in VEP or VECF proposal evaluation phase.

Event 10. Technical evaluation of VEP or VECF. a. During this event, the VEP or VECF is evaluated by the development and engineering agency to assure that the VEP or VECF is technically feasible. The customer subjects the proposal to review by its technical staff; a design configuration control group, if necessary; by cost analysts; and, finally, by the program manager. The skills required in reviewing VE proposal often involve a combination of those possessed by design engineers, production engineers, maintenance engineers, logistics specialists, cost accountants, estimators and analysts. In addition, to be effective, the review procedure requires skills in communicating, understanding and bridging all these specialized fields.

b. There is no standard method for reviewing the technical feasibility aspects of all VE change proposals. Decisions may be made quickly and easily on some because of the nature of the proposal or by reference to well-known, similar products or designs that support the change. Other proposals may require full-scale operational tests to satisfy the customer that they are technically feasible.

c. In formulating a proposal, the originators, if they do a complete job, investigate technical feasibility from several points of view. At the minimum, they satisfy themselves that:

- \* Function has not been sacrificed.
- \* Reliability requirements are met.
- \* Quality requirements can be maintained.
- \* The changed component or part is compatible with the system.
- \* Safety has not been prejudiced.
- \* Maintainability has not been sacrificed.

# **PROPOSAL ACCEPTANCE PLAN VEP OR VECP EVALUATION PHASE**

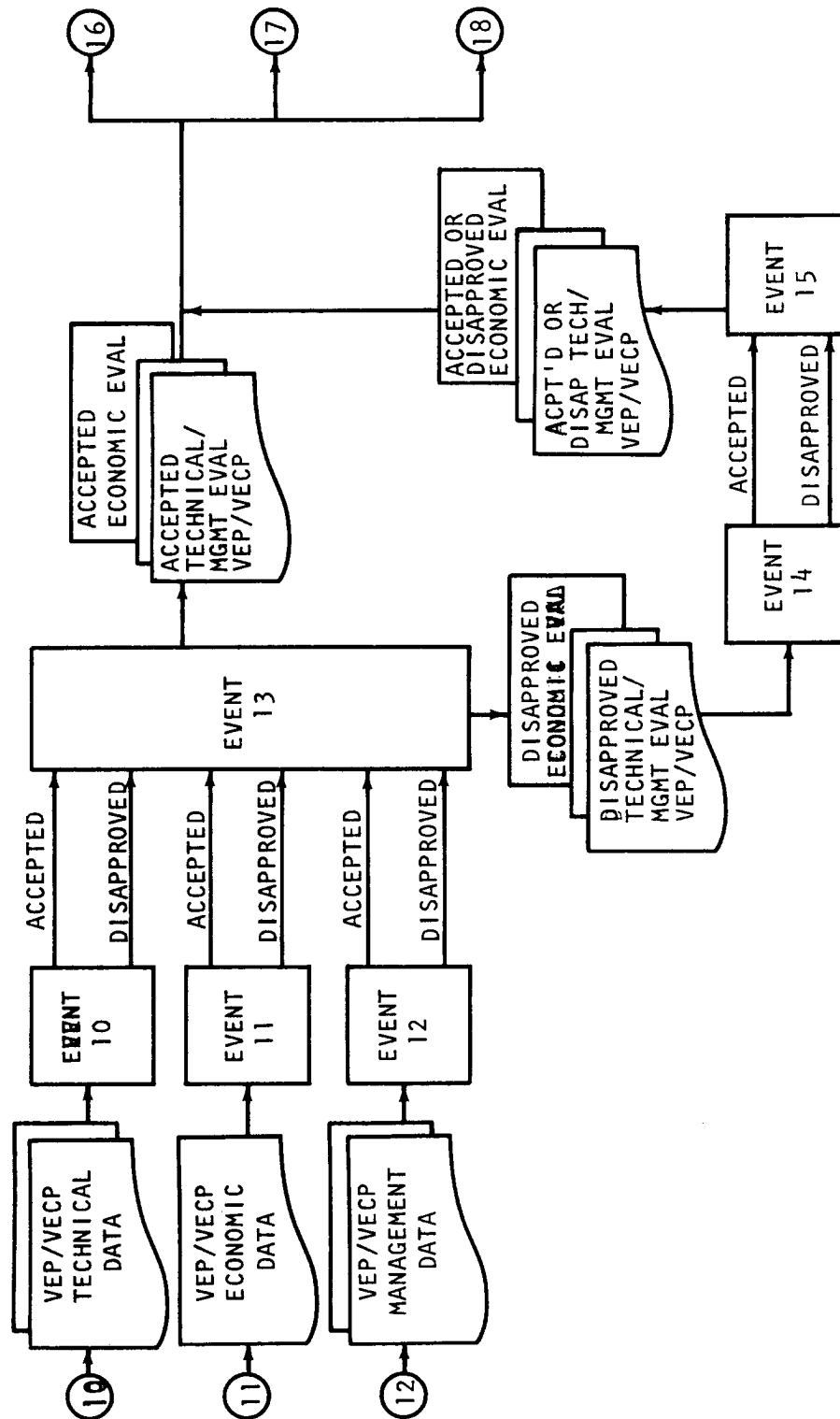


FIGURE 7

Obviously the reviewing authorities cannot repeat all the technical analyses performed by the originator. Rather, they assure themselves that approved, sound testing methods and reliable, approved data and engineering techniques were used by the originator during the process of formulating the proposal.

d. Finally, the review of technical feasibility includes consideration of its applicability to other products and/or specifications and standards. Even if the proposed change proves not feasible for the product intended, review authorities might determine that it could be used for other products. The point is that proposals can be useful to other product design and development engineering projects--especially if the originators' evaluations are rigorous and conclusive. The extent to which a proposal is applicable to other products also affects the reviewing authorities' consideration of its economic feasibility.

Event 11. Economic evaluation VEP s and VECPS. a. During this event, the VEP or VECPS is evaluated by financial control personnel to determine whether the implementation costs the Government would have to absorb will be surpassed by the savings the Government would realize if the VEP or VECPS were implemented.

b. The review for economic feasibility usually is more rigorous than for technical feasibility, because the reviewer has more complete knowledge of the economic than of the technical factors. The originator, building a component or system to a specification, is in a better position than the reviewer to prove technical feasibility. However, the originator seldom, if ever, has complete knowledge of such economic factors as:

- \* Number of units to which the change may ultimately be applied.
- \* Applicability of the proposal to other products.
- \* Loss from disposal (other than at originating activity) of material made obsolete by the change.
- \* Cost of negotiating a contract change notice.
- \* Cost of preparing and distributing technical documentation to all affected parties.
- \* Cost of reviewing proposal at customer level.

The first three of these factors can be determined with reasonable accuracy, at relatively little cost or effort. The others cannot, and in the absence of specific, readily available cost data, must be covered by some form of surcharge.

c. In terms of the number of units of a product, the originator measures the applicability of a VE change proposal to those units that will be produced after the change is implemented, as provided in his procurement contract then in force. Plans for future procurement contracts are

susceptible to cancellation. Therefore, to be realistic, the estimates of total savings from a VE change should apply to units produced under the contract currently in force. The customer reviewing authority does not necessarily have to be as constrained. He should use all knowledge available to help him make a judgment as to the most likely number of units to which a change will be applied.

d. While the originator should include in his proposal any known applicability to other products, the customer has a greater capability for identifying this. The reviewers should insure that their review procedures provide for this. In those cases where it is determined that a VE proposal is applicable to other products, the total net savings from such application must be determined.

e. The proposed change may make obsolete certain spare parts that have already been provisioned in inventories at the time the change is implemented. The value of these spare parts is reduced, perhaps to nothing. There may even be a significant additional expense to dispose of these obsolete parts. The loss of material made obsolete by a VE change may be significant to the savings calculations, although strictly speaking, they generally should not be counted as part of the nonrecurring expenses of making a VE change. The cost of providing this material has already been incurred in the past; what is done now cannot change the past. It is not realistic to penalize future realizable savings by expenses that were incurred in the past. As a practical matter, however, the expense from not using, and perhaps disposing of parts already bought for building the product or provisioning it in the field, may be included as a nonrecurring cost of a VE change--especially if the parts could be used if the change were not made.

f. All the costs that must be considered by review authorities cannot be developed or estimated easily or with a high degree of accuracy. Included in these costs are those of (1) negotiating a contract change notice, (2) preparing and distributing technical documentation and (3) reviewing the proposal at the customer level. In these cases, it is necessary that reviewing activities develop and apply the cost of evaluating and implementing the proposal to each VE change proposal. Development of this cost will not be an easy task because of the lack of cost data. Until such time as cost data is available, the cost of evaluating and implementing the proposal will have to be established somewhat arbitrarily. It is important that this cost of evaluating and implementing the proposal, once established, be made known to originators of VE change proposals and that reviewers make their application a matter of record in each proposal they review.

Event 12. Management evaluation of VEP or VECP. The VEP or VECP is evaluated by the responsible manager of the item to assure that the VEP or VECP fulfills the original required objectives of the item, regulation, procedure, etc.

Event 13. Evaluation and routing #2. The function of this event is to determine if the VEP or VECP has been disapproved by any of the previous evaluating events. If the VEP or VECP is disapproved, the routing must be

adjusted to include Events 14 and 15. If the VEP or VECP is accepted, the original routing is followed. (See table 4, para 6-7.)

Event 14. Final review of VEP or VECP of initial disapproved evaluations. Both the economic and technical or management evaluations are reviewed jointly by configuration control boards, VE managers, PCO, and line engineering activity personnel. Review action should determine whether the VEP or VECP has the possibility of fringe benefits, that could result in savings to the Government, such as higher productivity, simplification, greater reliability, etc. The savings should be itemized and the decision to reconsider the disapproval decision coordinated with the appropriate evaluators. The results of this coordination could reverse the disapproval decision and change the status of the VEP or VECP.

Event 15. Evaluation and routing #3. If the disapproval decision of the VEP or VECP has been reversed, the VEP or VECP should be processed according to the originally scheduled routing. (See table 3, para 6-7.) If the decision is still to disapprove the VEP or VECP then refer to table 5, paragraph 6-7.

6-5. VEP/VECP proposal implementation phase. Figure 8 shows the sequence of events in VEP/VECP proposal implementation phase of the proposed acceptance plan.

Event 16. Notice of Revision (NOR) prepared. Upon receipt of an accepted VEP/VECP, the development and engineering agency prepares and issues a NOR to modify the technical data package (TDP).

Event 17. VEP/VECP status notification to contractor. The PCO notifies the contractors that their VECP has been either accepted for implementation or disapproved. The PCO also provides a copy of correspondence and/or contract modification relative to the contractor's VECP to the ACO and VEPM. The PCO may give the contractor-s permission to start implementing the changes after they have been notified that a NOR was issued and they have received the NOR number. If an in-house generated VEP relative to an item that (a) contractor(s) is/are producing is approved by the Government, the PCO notifies the contractor(s) by sending them a copy of the NOR, and depending upon circumstances, directs the contractor(s) to implement the change.

Event 18. VECP status notification (VEPM). The Value Engineering Program Manager is notified of the final status of the VECP.

Event 19. Technical data package modified. After receipt of the NOR, the technical data package is modified to reflect the change to the item. The revised technical data applicable to the VECP is then forwarded by the PCO to the contractor for implementation.

Event 20. Change implemented by in-house producer. The in-house producer implements the change as outlined in the revised technical data.

Event 21. Change implemented by contractor. The contractor implements the change.

# **PROPOSAL ACCEPTANCE PLAN VEP/VECP IMPLEMENTATION PHASE**

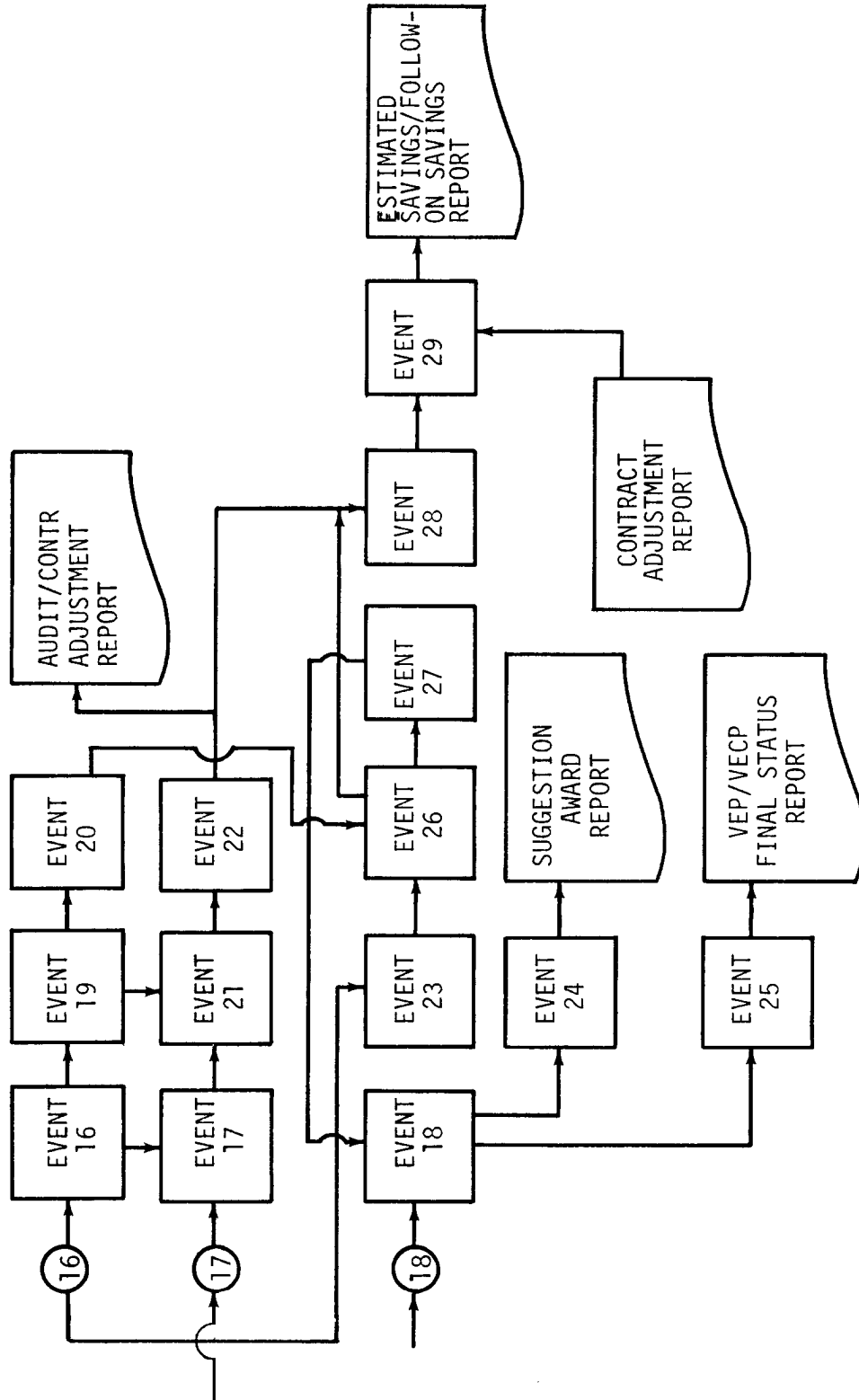


FIGURE 8

Event 22. Change has been placed in production. Upon completion of implementation, or when the change has been placed into production, the contractor notifies the PCO of the date and information on implementation. The PCO requests a quantity audit of the items remaining on the contract to facilitate the negotiation of the VEC/VEP implementation costs and savings.

Event 23. Modification work order (MWO) prepared. Upon receipt of an accepted VEP/VECP, depot maintenance personnel or major subordinate command maintenance personnel prepare and issue an MWO.

Event 24. Originator notified of final VEP decision. The VEPM should notify the originator through the proper channels of the final status of the VEP.

Event 25. Providing final status of VEP/VECP. The VEP/VECP record should be updated and a report made to higher management.

Event 26. Change implemented by Government. All VEP s type 6, 7, 9, 11 and 12 (see para 6-6) changes are implemented by the responsible management activity.

Event 27. Notification that VEP has been implemented. When a VEP-type 6, 7, 9, 11, or 12 change has been implemented by the Government activity, the VEPM should be notified of the date and information on implementation.

Event 28. Estimate of follow-on savings computed. When a VEP/VECP is accepted and implemented on follow-on production orders, all follow-on savings should be computed. Appropriate savings resulting from implementation of a VEC/VEP should be shared with the contractor.

Event 29. Estimated total savings computed. When a VEP/VECP is accepted and implemented, the implementation costs should be established and the estimated savings should be computed. Figure 9 shows all the events in the VE proposal management program.

### SECTION III. IDENTIFICATION AND PROCESSING OF VEP/VECPs

6-6. Identification of VEP/VECP types. The identification of VEP/VECP types and what actions are required in processing of the VEP/VECP after acceptance are outlined in table 2.

6-7. VEP/VECP routing criteria. Guidance on routing of VEPs/VECPs is outlined in tables 3, 4, and 5.

Table 3 contains - Evaluation and Routing #1 for Event 9, Page 6-15.

Table 4 contains - Evaluation and Routing #2 for Event 13, Page 6-16.

Table 5 contains - Evaluation and Routing #3 for Event 15, Page 6-16.

6-8. Practice VEP routing exercise. The following exercise will facilitate the understanding of routing a VEP:

#### EXERCISE

A VEP involving a technical change proposal is submitted by a Government activity on an item being produced by a defense contractor.

a. First Step: Identify VEP Type

(1) Known facts are:

- (a) Technical change proposal.
- (b) Produced by a defense contractor.
- (c) Submitted by a Government activity.

(2) Refer to the decision table for identifying VEP types (Table 2). The known facts identify this proposal as a VEP-3 type. The following actions must be performed if the proposal is accepted by the government:

- (a) NOR prepared.
- (b) Technical data package modified.
- (c) Implementation costs estimated.
- (d) Contract modified.
- (e) Estimated savings and estimated follow-on savings computed.

b. Second Step: Evaluation and routing #1 for Event 9 (initial routing). Upon completion of the VEP presentation phase, the initial routing through the evaluation and implementation phases should be accomplished. Refer to the routing table for initial routing (evaluation and routing #1) of VEP/VECP table 3. Since the sample is a VEP-3 type proposal, routing C applies and the VEP should be routed through Events 10, 11, 12, 13, 16, 17, 18, 19, 21, 22, 25, 28, and 29. (It is assumed that the VEP will be accepted -- if so, it should be processed through each of these events.)

c. Third Step: Evaluation and routing #2 for Event 13. Upon completion of the evaluation events, all three evaluations are jointly checked to determine if all were accepted, refer to the decision table for (evaluation and routing #2) checking evaluations (table 4). Assume that all three management evaluation decisions are to accept the VEP. In this case, decision J, K, or P applies and the VEP is routed to the next event of the original routing schedule. If the management evaluation decision is to disapprove the VEP, decisions L, M, N, O, Q, and R apply and the VEP routed to Event 14, final review of evaluations; and Event 15, evaluation and routing #3.

# VE PROPOSAL MANAGEMENT

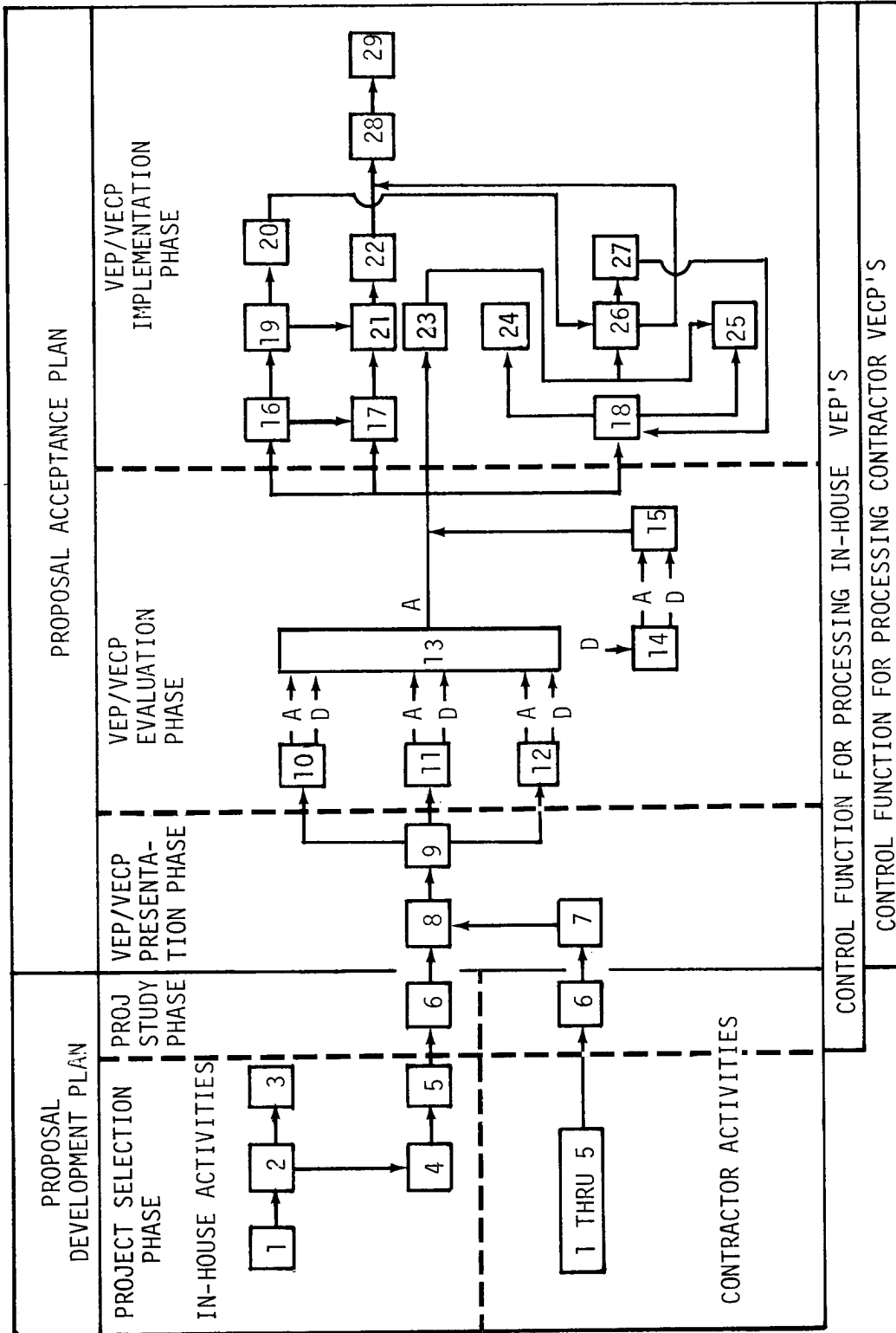


FIGURE 9

## IDENTIFICATION OF VEP/VECP TYPES

THE FOLLOWING TABLE WILL ASSIST IN THE IDENTIFICATION OF VEP/VECP TYPES AND ACTIONS REQUIRED IN PROCESSING THE VEP/VECP AFTER ACCEPTANCE.

TABLE 2

IF . . . . .	VEP/VECP TYPES											
	1	2	3	4	5	6	7	8	9	10	11	12
TECHNICAL DATA CHANGE PROPOSAL?	Y		Y		Y		Y	Y	Y			
NON-TECHNICAL DATA CHANGE PROPOSAL?		Y		Y		Y				Y	Y	Y
ITEM IN PRODUCTION BY CONTRACTOR?	Y	Y	Y	Y								
ITEM IN PRODUCTION BY GOVERNMENT?						Y	Y					
ITEM NOT IN PRODUCTION?					Y							Y
CONTRACTOR SUBMITTED VECPP?	Y	Y						Y		Y		
GOVERNMENT SUBMITTED VEP?			Y	Y	Y	Y	Y		Y		Y	Y
R AND D ITEM?								Y	Y	Y	Y	
THEN . . . . .												
NOR PREPARED	X		X		X		X	X	X			
MWO PREPARED												X
TECH DATA PACKAGE MODIFIED	X		X		X		X	X	X			
IMPLEMENTATION COSTS ESTIMATED	X	X	X	X	X*			X		X		X
CONTRACT MODIFIED	X	X	X	X				X		X		
SHARING OF SAVINGS	X	X						X		X		
ESTIMATED SAVINGS	X	X	X	X		X	X	X	X	X	X	X
ESTIMATED FOLLOW-ON SAVINGS	X	X	X	X	X	X	X	X	X	X	X	X
SHARING OF FOLLOW-ON SAVINGS*	X	X						X		X		

\* IF APPLICABLE

## VEP/VECP ROUTING CRITERIA

THE FOLLOWING ROUTING TABLES OUTLINE THE RULES FOR ROUTING  
A VEP/VECP. TABLE 3 COVERS EVALUATION AND ROUTING 1 FOR EVENT 9.  
TABLE 4 COVERS EVALUATION AND ROUTING 2 FOR EVENT 13. TABLE 5  
COVERS EVALUATION AND ROUTING 3 FOR EVENT 15.

TABLE 3

EVENT 9 EVALUATION AND ROUTING #1 IF . . . . .		ROUTING							
		A	B	C	D	E	F	G	H
VECP 1 OR VECP 8?		Y							
VECP 2 OR VECP 10?			Y						
VEP 3?				Y					
VEP 4?					Y				
VEP 5?						Y			
VEP 6 OR VEP 11?							Y		
VEP 7 OR VEP 9?								Y	
VEP 12?									Y
THEN . . . . .	EVENT								
ROUTE THROUGH EVENTS CHECKED . . . . .	10	X		X		X		X	X
	11	X	X	X	X	X	X	X	X
	12	X	X	X	X	X	X	X	X
	13	X	X	X	X	X	X	X	X
	16	X		X		X		X	
	17	X	X	X	X				
	18	X	X	X	X	X	X	X	
	19	X		X		X		X	
	20						X	X	
	21	X	X	X	X				
	22	X	X	X	X				
	23								X
	24						X	X	X
	25	X	X	X	X	X	X	X	X
	26						X	X	X
	27						X	X	X
	28	X	X	X	X	X	X	X	X
	29	X	X	X	X	X*	X*	X*	X

\* IF POSSIBLE

# VEP/VECP ROUTING CRITERIA

TABLE 4

EVENT 13 EVALUATION & ROUTING #2 IF . . . . .		POSSIBLE DECISIONS								
		J	K	L	M	N	O	P	Q	R
TECHNICAL EVALUATION ACCEPTED?		Y	Y	N	Y	Y	N			
ECONOMIC EVALUATION ACCEPTED?		Y	N	Y	N	Y	N	Y	Y	N
MGMT EVALUATION ACCEPTED?		Y	Y	N	N	N	N	Y	N	N
THEN . . . . .	EVENT									
ROUTE THRU EVENTS CHECKED . . .	14			X	X	X	X		X	X
	15			X	X	X	X		X	X
ROUTE TO NEXT EVENT OF TABLE #3		X	X					X		

TABLE 5

EVENT 15 EVALUATION & ROUTING #3 IF . . . . .		DECISION							
		S	T	U	V	W	X	Y	Z
FINAL EVALUATION VEP/VECP DISAP		X	X	X	X	X	X	X	X
VECP 1 OR VECP 8?		Y							
VECP 2 OR VECP 10?			Y						
VEP 3?				Y					
VEP 4?					Y				
VEP 5?						Y			
VEP 6 OR VEP 11?							Y		
VEP 7 OR VEP 9?								Y	
VEP 12?									Y
THEN . . . . .	EVENT								
REROUTE THROUGH THE EVENTS CHECKED . . .	17	X	X						
	18	X	X	X	X	X	X	X	
	24			X	X	X	X	X	X
	25	X	X	X	X	X	X	X	X

d. Fourth Step: Evaluation and routing #3 for Event 15.

(1) If the final management evaluation decision is to accept the VEP, then decisions J, K, and P applies, and the VEP should be routed to the next event of the original routing schedule.

(2) If the final management evaluation decision is to disapprove the VEP, and since this is a VEP-3 type proposal; the routing should be adjusted to route the VEP through Events 18, 24, and 25 to retire the VEP.

## CHAPTER 7

### VALUE ENGINEERING MANAGEMENT DURING ACQUISITION, OPERATION, AND MAINTENANCE OF MATERIEL

#### SECTION I. ACQUISITION PLANNING AND ACTION

7-1. Acquisition planning phase. This phase, shown in figure 10, sets the stage for the phases that follow and provides the connecting link to the materiel life cycle (see fig 3). This phase may not require any action by the VE office.

Event 1. Defense planning. Within this event the primary defense planning that establishes the level of national defense is accomplished. The decisions should establish the amount of:

- a. Materiel support.
- b. New materiel development.
- c. Funds necessary to accomplish new materiel development and supply procurement.

Event 2. Budget funds. Estimate the amount of funds needed to carry out the primary defense planning. Steps could be as follows:

- a. Receive information on kind and quantity of items needed.
- b. Estimate future item unit cost.
- c. Budget (or estimate) the amount of funds needed to perform VE studies.
- d. Receive information on forecasted VE royalty payments.
- e. Estimate the amount of funds needed to cover VE royalty obligations and VE reward payments.

Event 3. Item acquisition section. The decision of what and how much to procure is based on defense plans. The result of the decision is the initiation of an acquisition action request to the appropriate procuring agency.

Event 4. New materiel development. The Government design agencies may contract all or a portion of new materiel development, by initiating a development acquisition action request to the appropriate procurement agency.

7-2. Acquisition action phase. Figure 11 shows the sequence of events in the acquisition action phase.

## ACQUISITION PLANNING PHASE

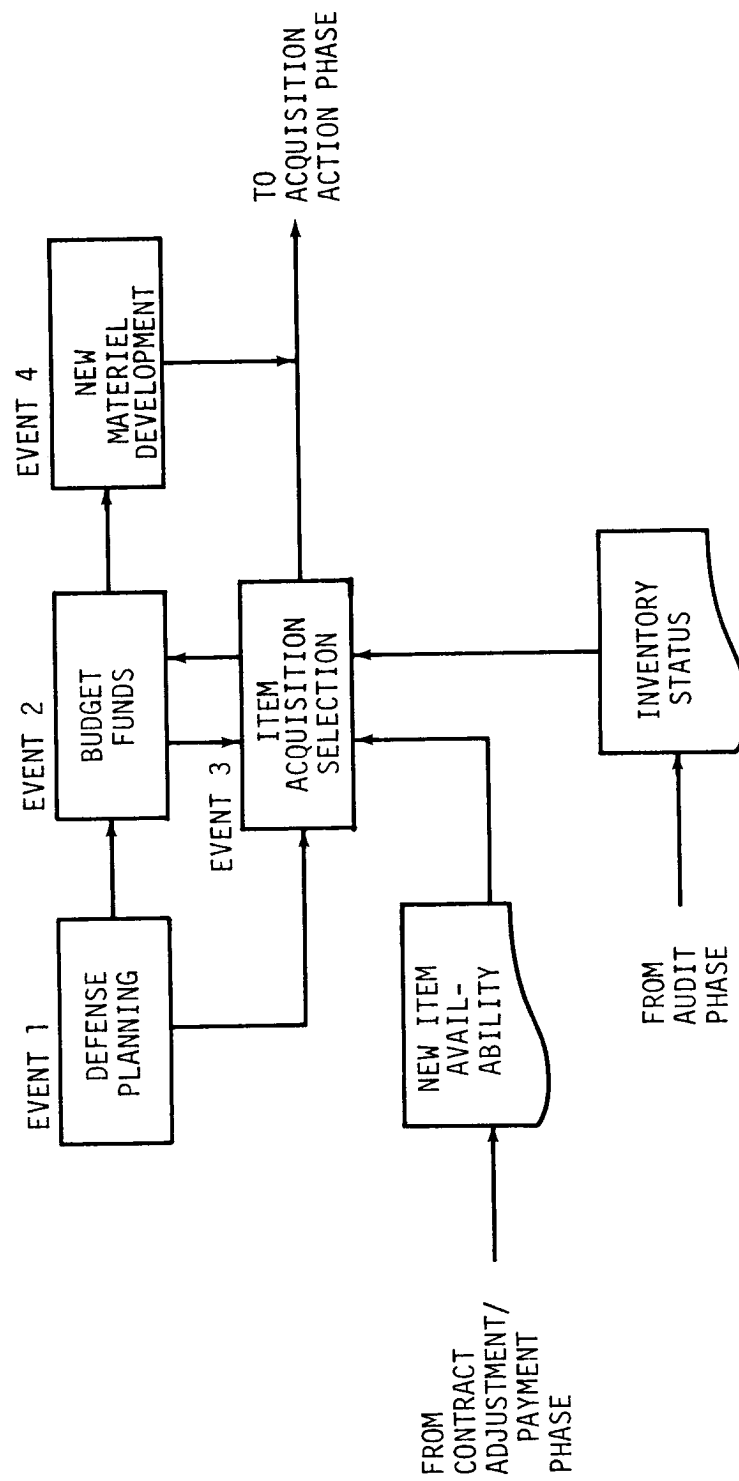


FIGURE 10

Event 1. Acquisition action planning. Decisions should be made on type of contract, type of solicitation, and kind of contract action (advertised, negotiated, etc.).

#### Development acquisition

Event 2. Initial validation phase (VE program planning proposal) requirements. The information that should be included in the request for proposal required of the contractor submitting an initial validation phase VE program planning proposal is shown in table 6.

Event 3. Request for proposal (RFP) preparation. The complete bid package should be prepared for a development acquisition. The initial validation phase requirements of Event 2 should be included in the RFP.

Event 4. Request for proposal release. The bid package should be released to eligible bidders.

Event 5. Initial validation phase (VE program planning proposal) evaluation. The bid responses from eligible bidders should be evaluated. These bid responses will include the bidders' complete response to all elements of the RFP. A detailed evaluation of the VE program planning proposal element of the RFP should be performed according to the guidance shown in table 6.

Event 6. Validation phase (VE plan) requirements. The validation phase contract should require the contractor to submit the planning information (shown in table 6) relative to the development of a VE plan that details the VE tasks to be performed during full-scale development.

Event 7. Validation phase contract negotiations. Contract negotiations should be accomplished and during these negotiations the VE plan should be promoted.

Event 8. Validation phase contract award(s). Contract(s) should be awarded.

Event 9. Validation phase (VE plan) evaluation. The contractor submitted VE plan, which is part of the total validation phase plan, should be evaluated for performing VE during full-scale development. A detailed evaluation and scoring of each bidder's VE plan is performed taking into account the information required, see table 6.

Event 10. Final full-scale development phase VE plan formulation. The required development phase VE plan should include the information shown in table 6. The plan should be formulated and detailed by persons in the VE office.

Event 11. Full-scale development phase contract negotiations. During this event:

## ACQUISITION ACTION PHASE

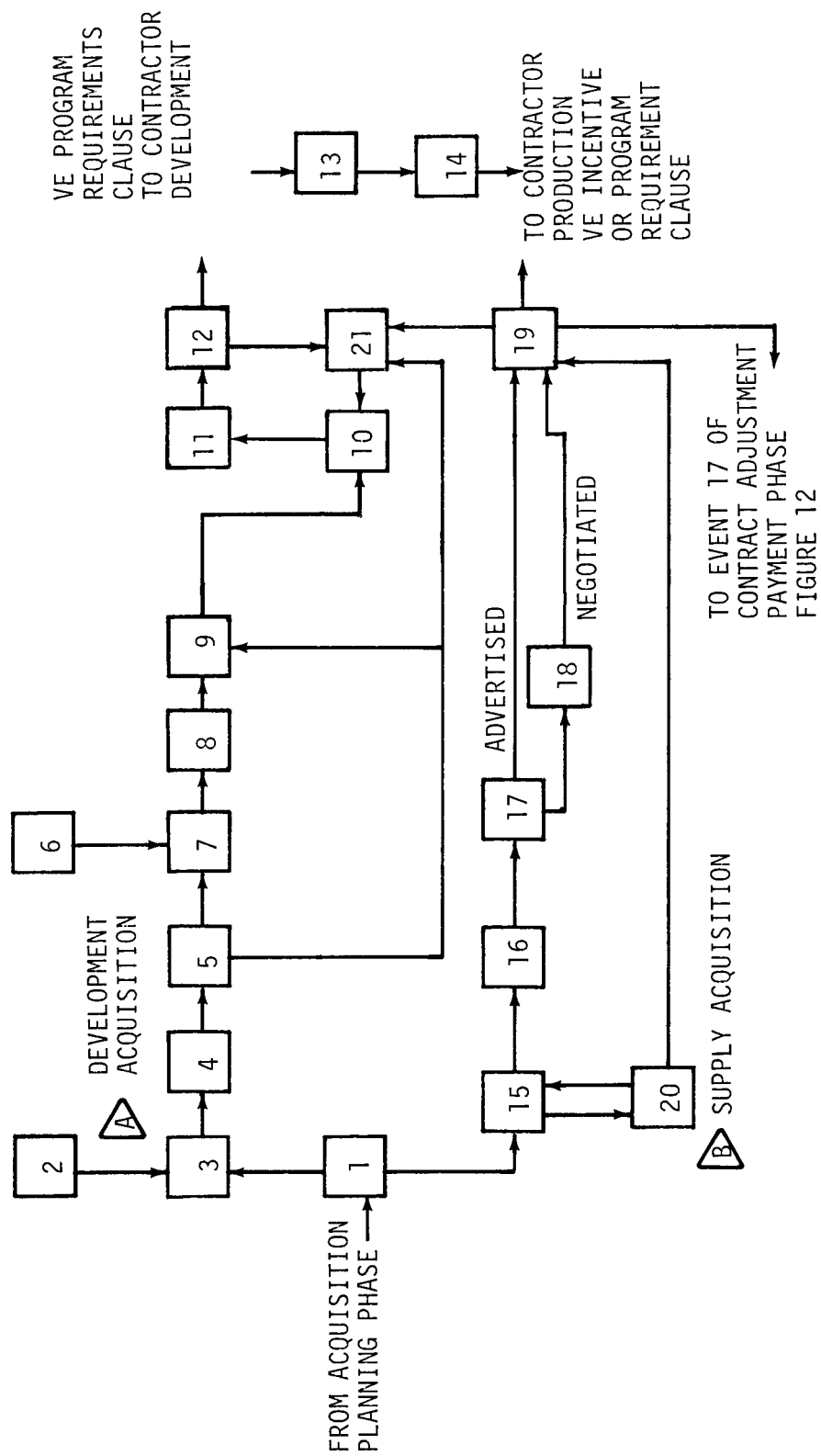


FIGURE 11

# VALUE ENGINEERING PROGRAM PROPOSAL/PLAN

## INFORMATION REQUIRED AND EVALUATED

TABLE 6 INFORMATION	EVENT				
	2	5	6	9	10
1. STATEMENT OF CONTRACTORS PAST EXPERIENCE IN CONDUCTING A VE PROGRAM	X	X			
2. OUTLINE OF CONTRACTOR PLAN FOR PERFORMING VE DURING DEVELOPMENT	X	X			
3. A CHECK THAT ALL PERTINENT FACTORS HAVE BEEN INCLUDED IN CONTRACTOR'S OVERALL VE PLAN OUTLINE		X			
4. OUTLINE OF CONTRACTOR PLAN FOR USING VE IN ALL AREAS WHERE IT WOULD BE ECONOMICALLY FEASIBLE	X	X			
5. STATEMENT OF CONTRACTOR RECORD FOR SUBMITTING VECP'S	X	X			
6. DETAIL CONTRACTOR VECP ACCEPTANCE AND MONETARY RECORD			X	X	
7. DETAIL CONTRACTOR PLAN FOR PERFORMING VE DURING FULL-SCALE DEVELOPMENT					
A. A DESIGN-TO-COST			X	X	X
B. A VALUE STUDY SELECTION PROGRAM WITH SPECIFIC PARTS SELECTED AND RANKED			X	X	X
C. SPECIFIC VE TASKS IDENTIFIED AND PERFORMANCE OUTLINED			X	X	X
D. MANPOWER FORECAST			X	X	X
E. FUNDING FORECAST			X	X	X
F. SCHEDULE FOR VE STUDIES			X	X	X
G. SCHEDULE FOR OTHER VE TASKS			X	X	X
H. VE PERSONNEL: QUALIFICATIONS, EXPERIENCE, ADVANCEMENT, PROBABILITY OF ASSIGNMENT TO VE WORK			X	X	
I. LOCATIONS OF VE PERSONNEL IN THE ORGANIZATIONAL STRUCTURE			X	X	
J. LOCATIONS OF VE OFFICE IN THE ORGANIZATIONAL STRUCTURE			X	X	
8. REPORT SCHEDULE REQUIREMENTS					X

- a. Contract negotiations should be accomplished.
- b. VE program should be promoted with the prospective contractor.
- c. Final required developmental VE effort should be negotiated.

Event 12. Full-scale development phase contract award(s). The contract should be awarded and the VE office notified of contract award.

Event 13. Full-scale development phase contractor activities. During this event the contractors performs the following activities:

- a. Perform full-scale development including production of engineering prototypes for test purposes.
- b. Conducts value engineering studies under the program requirement clause of their contracts.
- c. Prepares a report of their VE effort.
- d. Submits VECP s, if applicable.

Event 14. Full-scale development phase Government reporting of contractor's VE achievements. The VEPM reports the results of the contractor's VE results, e.g., number of VE studies and total proposed dollars saved.

#### Supply acquisition

Event 15. Bid (IFB, RFQ, RFP) package preparation. The complete bid package should be prepared for a supply and/or maintenance acquisition. Information should be requested and received relative to pending royalty obligations. Additional funds may need to be requested to cover royalty obligations. The bid package should be reviewed to assure that the appropriate VE clause has been included.

Event 16. Bid package release. The bid package should be released to eligible bidders.

Event 17. Bid evaluations. Bid responses from eligible bidders should be received and evaluated. If advertised procurement, the contractor is selected. If it is a negotiated procurement, contractor(s) should be selected and both parties should prepare for contract negotiation.

Event 18. Supply and/or maintenance phase contract negotiated, if applicable. Contract negotiations should be accomplished and the VE program should be promoted with the prospective contractor. The VEPM should assure that the appropriate VE clauses have been included in the contract.

Event 19. Supply and/or maintenance phase contract award(s). The contract should be awarded. It includes an appropriate paragraph on any pending royalty obligations. The VE office should be notified of contract awards.

Event 20. Pending royalty obligation review. The records should be reviewed to establish the requirement for making royalty payments on acquired items.

Event 21. VE office support and analysis. The VE office should provide evaluation of VE program proposals, and supports formulation of final full-scale development phase VE plan. Information received on contracts awarded (from Events 12 and 19) should be used to select contractors for indoctrination visits.

## SECTION II. CONTRACT/PROGRAM COMPLETION PLAN

7-3. Program events. Figure 12 shows the sequence of phases and program events in the audit, contract adjustment/payment, and evaluation phases of contract/program completion plan.

7-4. Audit phase. The auditing of a program is a continuous function for management personnel. To assure that all VE programs are evaluated, the audit function has been included as a part of contract/program completion plan.

Event 1. Government development VE program audit. To accomplish this audit, the VEPM needs to collect information on the operation of the program during the Government development of materiel. Some of the information for the audit could include:

- a. In-process review (IPRs).
- b. VE project studies.
- c. Changes accomplished.
- d. Monetary impact of value changes.

Event 2. Government production and maintenance VE program audit. To accomplish this audit, the VEPM needs to collect information on the operation of the program during Government production and maintenance of materiel. Some of the information for the audit could include:

- a. VE project studies.
- b. Changes accomplished.
- c. Monetary impact of value changes.

## CONTRACT/PROGRAM COMPLETION PLAN

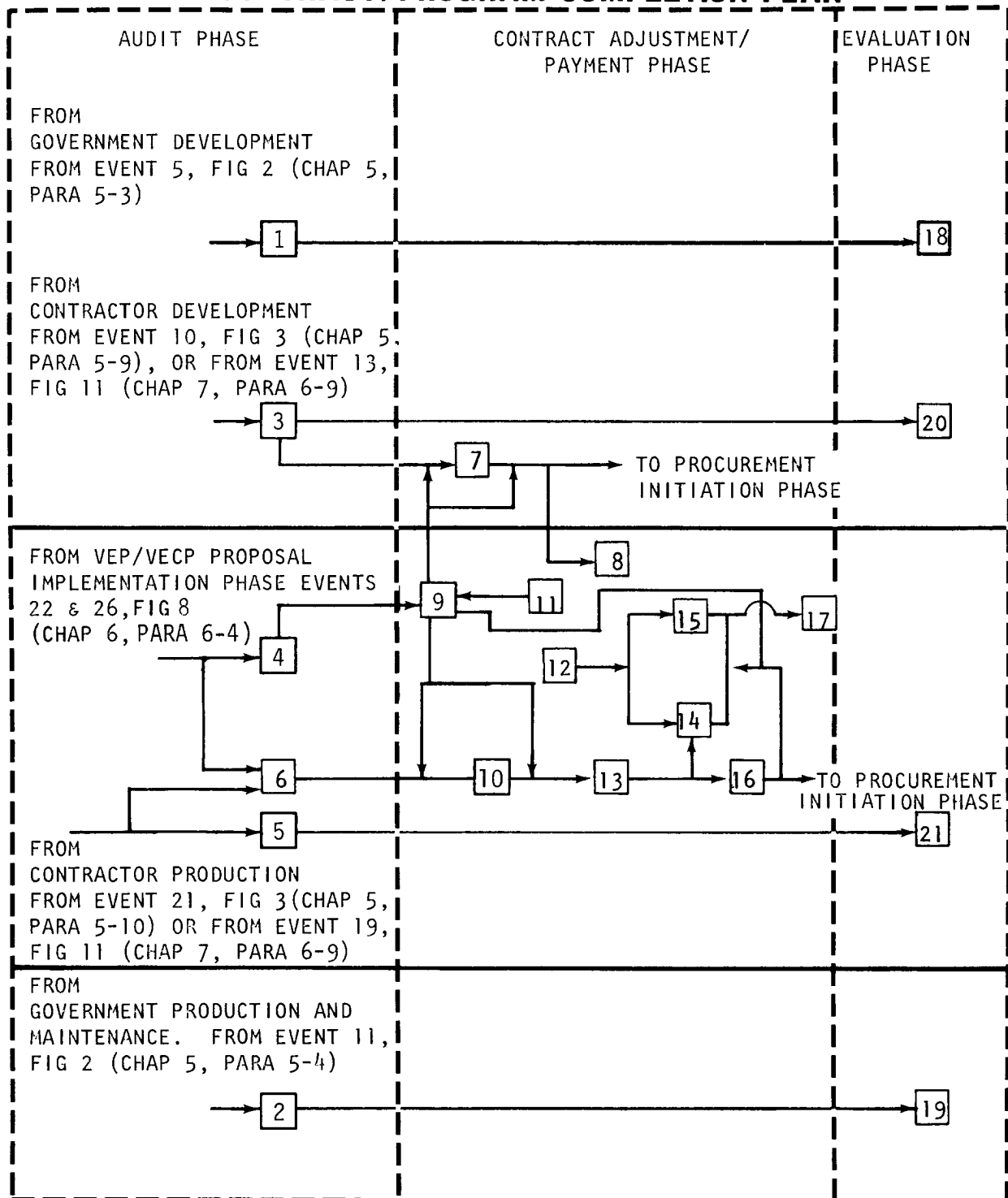


FIGURE 12

Event 3. Contractor development VE program audit. To accomplish this audit, the VEPM needs to collect information on the operation of the program during contractor development of materiel. Some of the information for the audit could include items a, b, c, and d from Event 1 above plus other information required by the contract.

Event 4. Production implementation VEP/VECP audit. If an implemented VECP caused the change, an audit is made of the quantity of new units made or to be made in accordance with the VECP. This information would be supplied to the PCO. Whether the implemented change is a VEP or VECP, the VEPM should be notified of the quantity of units to which the proposal applies. This is an extension of the proposal acceptance plan, VEP/VECP implementation phase, Events 22 and 27 described in chapter 6.

Event 5. Contractor production VE program audit. To accomplish this audit, the VEPM needs to collect information of the program during contractor production of materiel. Some of the information for the audit could include: VE project studies, changes accomplished, and monetary impact of value changes.

Event 6. Deliver accepted items. Production items delivered will change the stock level. Satisfactory performance of maintenance on items of materiel, will return items of materiel to the user in a restored condition.

7-5. Contract adjustment/payment phase. Contract adjustment/payment is a very necessary part of the contract/program completion plan.

Event 7. Payment for full-scale development phase contracted work. Payment is made by the PCO to the contractor for contracted development work. This action provides a link back to the acquisition initiation phase to continue the materiel life cycle of the item.

Event 8. Principal contracting officer solicits whether a development contract can be closed. The PCO solicits from interested parties, including the VEPM, on whether the development contract can be closed. The VEPM and/or PCO/ACO checks to determine whether there are outstanding VE sharing obligations. If there are, the contract remains open. If not, the PCO proceeds to close-out the contract.

Event 9. Contracting officer adjusts development, supply, or maintenance contract. Based on information from Event 4, the contracting officer should adjust the instant contract, under which an accepted VECP was submitted, to reflect the sharing of the VE cost reduction savings.

Event 10. Payment to contractor for production/maintenance items delivered. Total payments or incremental payments is made by the PCO to the contractor for production items delivered, or for completion of maintenance on items of materiel for items accepted by the Government. This action provides a link back to the acquisition initiation phase to continue the materiel life cycle of the item.

Event 11. Payment of VE collateral share obligations. Payment should be made for collateral VE savings, if applicable.

Event 12. VE royalty obligations review. Records should be reviewed to establish the requirement for making VE royalty payments for acquisition of new items or for maintenance of additional items.

Event 13. Award follow-on contract. Contracting officer awards followon contract for production or maintenance of materiel items. Note. This event corresponds to Event 19 of acquisition action phase except that this event is for follow-on acquisition.

Event 14. Contracting officer modifies contract to pay VE royalty shares. Contracting officer should modify instant contract under which VECP was accepted to account for incremental VE royalty payments for items delivered or for completion of maintenance on items of materiel procured on follow-on contract.

Event 15. Payment of final VE royalty obligations. Final VE royalty share payment should be made to contractor that originated the implemented VECP as stated under Event 14.

Event 16. Payment for follow-on acquisition of items. Total payments or incremental payments are made to the follow-on producer for production items delivered and accepted by the Government, or for completion of maintenance on items of materiel.

Event 17. Contracting officer notified to close contract. As a result of the periodic review of pending VE royalty obligations, the contracting officer should be notified of any contracts with expired VE royalty obligations so that those contracts may be closed. This event closes out the contract awarded at Event 19 of the acquisition action phase.

7-6. Evaluation phase. Evaluation is necessary to provide information for effective VE program control.

Event 18. Government development VE program evaluation. A review of the information from Event 1 and an analysis made of the relative success in meeting the established goals for this program could result in reporting the VE savings realized during Government development and a prediction of what the savings would be when the item goes into production.

Event 19. Government production VE program evaluation. A review of the information from Event 2 and an analysis made of the relative success in meeting the established goals for this program should result in reporting of VE savings.

Event 20. Contractor development VE program evaluation. A review of the information from Event 3 and an analysis made of the relative success in

meeting the established goals for this program could result in reporting the VE savings realized during contractor development and a prediction of what the savings would be when the item goes into production.

Event 21. Contractor production VE program evaluation. A review of the information from Event 5 and an analysis made of the relative success in meeting the established goals for this program should result in the reporting of VE savings.

CHAPTER 8

REFERENCES

- a. Defense Acquisition Regulations, Section 1, Part 17, Value Engineering.
- b. DOD Directive 5000.1, Acquisition of Major Defense Systems.
- c. DOD Directive 5000.2, Major System Acquisition Process.
- d. DOD Directive 5000.28, Design-to-Cost.
- e. DOD Directive 5010.8, DOD Value Engineering Program.
- f. DOD Handbook 5010.8-H, Value Engineering Handbook.
- g. DOD Instruction 7110.2, Budget Guidance for Value Engineering.
- h. DOD Report by AOA on Fringe Effects of Value Engineering, May 1964.
- i. AR 5-4, Department of the Army Productivity Improvement Program.
- j. AR 70-1, Army Research, Development, and Acquisition.
- k. AR 70-17, System/Program/Project Product Management.
- l. AR 70-37, Configuration Management.
- m. DA Pamphlet 5-4-5, Value Engineering Handbook.
- n. DARCOM-R 11-27, Life Cycle Management of DARCOM Materiel.
- o. DARCOM-R 70-5, Materiel Acquisition Decision Process Reviews.
- p. **DARCOM-R 70-8**, DARCOM Value Engineering Program.
- q. DARCOM Supplement #1 to AR 70-37, Configuration Management.
- r. MIL-V-38352, VE Program Requirements.

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